RAILROAD GAZETTE

SATURDAY, NOVEMBER 7, 1874.

Contributions.

The "Contract" of the Western Railroad Bureau.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In the RAILROAD GAZETTE of August 8 I called attention to some of the causes of the failures of railroad conventions in their attempts to reform the abuses that have crept into and demoralized railroad management. Reading your issue of 17th instant I was surprised to find a very pertinent example of the slovenliness in their work which I attributed to such bodies and to the committees and officers usually appointed by them. This example is the agreement *said* to have been entered into at New York by certain Western railroad companies, the full text of which you publish. You vouch for it,* so I suppose we must not doubt its authenticity. Without your evidence I would have concluded that some jovial brother of the B. L. E. had tried to hoax us by concocting late at night an imaginary contract purporting to be a combination of employers, and that he had taken advantage in a convivial moment of some *Herald* attache to get it into print. Such English—oh, shade of Shakespeare! Such grammar—oh, public-school system, where are thy teachers! Such sagacity, such foresight, such business acumen—oh, "Philadelphia lawyers," where were you? But if the diction is a little obscure, and if the grammatical construction is a little intricate, the author or authors are sound on finance. Hear them: Sec. 3. "*Such Commissioners * * * may employ such clerical force as may be necessary to thoroughly conduct the business and duties of their office, the expenses of which, the salaries of the Commissioners and their traveling and incidental expenses, shall be assessed by the Commissioners and paid monthly by each company party hereto* PRO RATA, ACCORDING TO THE GROSS ANNUAL INCOME OF EACH COMPANY AS ASCERTAINED FOR THE LAST CURRENT YEAR," etc. This is good. We may forgive the expression "*pro rata* according to," as no railroad man of any pretension could write a memorandum or speak an address to his clerk without using "*pro rata*" to show his acquaintance with the modern Eleusinian mysteries; but what shall we say of the "ANNUAL income of the LAST CURRENT year?" How many incomes have railroad companies in each year? Beware, gentlemen, how you let grangers into your secrets! Which particular period is the LAST CURRENT year? No wonder that Watson and Dunan dispute. No wonder that Mr. Keep laments our "confused understanding of the intricacies of railroad transportation." Moreover, be it known to all men that the governor of the school from which this gem proceeded is an LL. D. But let us recover our equilibrium, anoint our aching sides, and proceed gravely to examine the document.

1st. We find in the list of parties to the agreement the names of the Atlantic & Great Western and the Cleveland, Columbus, Cincinnati & Indianapolis Companies. Have these companies the power to enter into such a contract? Perhaps the latter has—I am not sure; but has not the Atlantic & Great Western Railroad Company leased its road to the Erie Railway Company? Is it the Erie Railway Company or the Atlantic & Great Western Railroad Company which operates the road?

2d. The contracting parties in Section 1 agree to the formation of a bureau consisting of seven members. THE QUALIFICATIONS OF THE COMMISSIONERS are to be: First, that they are experienced in railway affairs; second, that they are in no way connected with the lines represented in the agreement.

Not a word is said about the amount or kind of experience required. The word "experienced," therefore, stands for an unknown, indefinite quantity. It may be said that the electors will be the judges of this matter. If so, and if the electors choose a man who has had no experience, or next to none, what then? Where's the remedy? None. However, this is not very important; it is merely a little superfluity.

What is meant by connected? Is it intended that the candidate shall not be employed on one of the lines, but that he may be pecuniarily interested in it, or that he must have no interest at all in it? If the latter, it would have been well to say so. He must not be "connected" with any line "*represented* in the agreement;" by implication he may be "connected" with any line not represented. Why the difference? Evidently he should have no pecuniary interest in any railroad company in the United States or Canada.

So much for qualifications; now how are they to be ascertained? The document does not tell us. It should direct the commissioners to make affidavit at the time of appointment and subsequently annually, copies of which should be attached to the annual report.

BY WHOM ARE THE SEVEN COMMISSIONERS TO BE APPOINTED? The document tells us in the vaguest way: "Those elected at the Saratoga Springs meeting are hereby recognized and accepted;" if any vacancy occur, "THE PARTY or companies originally designating him shall appoint another in his stead, who SHALL be satisfactory to the other parties." Possibly this is lucid to some transcendental minds. Suppose that THE PARTY has lapsed: what then? Suppose that some of the original companies are no more or have become renegades: what then? If we stand upon the bond, no successor can be elected. Then how is it to be known who were the original electors? The record should show. However, when the successor is elected, "he SHALL be satisfactory to the other parties." This is, I hope, satisfactory to the other parties—whoever they may be. It will save them some trouble, for evidently they are not expected to meddle in the affair. There is another little awkward fact about the "original companies" and THE PARTY. The election took place by night, without due notice, at Saratoga Springs, before any agreement had been entered into, while some of the companies interested were not represented and others were not legitimately represented. Have the companies not represented in that caucus been disfranchised? The document says so. If that is not authority, of what use is it?

3d. The next thing in the agreement is THE DUTY OF THE COMMISSIONERS. Their duty "shall be to regulate and establish through rates for the transportation of passengers and freight over the several lines, between competitive points east and west, in conjunction with the Eastern Bureau of Commissioners, who represent the so-called trunk lines of the country lying west [sic] of Buffalo, Pittsburgh and the Ohio River." I refrain from criticising the grammatical construction of this sentence further than to say that the language does not literally convey the author's idea. Why is the expression "so-called trunk lines" used? Are not the Commissioners intended to represent all roads doing through business east of the points named? If not, it would have been best to use simply the designation of the Bureau or to name the companies whose wishes are to be consulted. Are the Grand Trunk and the Baltimore & Ohio included in the so-called trunk lines, or are the Western companies prepared to make common cause against those powerful corporations? The record should be very clear on this point if the contracting parties mean business. Presumably the word *west* is a typographical error, as the country lying *east* of the point named is the one intended to be referred to.

Why are the Commissioners to regulate east and west rates only and not rates between all points at which the contracting parties compete or are in competition with non-contractors?

4th. POWERS OF THE COMMISSIONERS.—There seems to be made either an *unintentional* jumble of, or an *intentional* distinction between the *duties* and the *powers*. Their duty as given above, is to regulate and establish rates; their powers are more extensive. They "shall have power":

(*a*) To establish through rates from time to time. (Sec. II.)

(*b*) To complain in writing to companies of the violation of rates and to demand the dismissal of the violator and they SHALL in case of violation by any freight organization, company or subordinate of such, to "prescribe such other penalties" and "the modes of enforcing the same as may be found necessary." (Sec. II.)

(*c*) To employ "such clerical force as may be necessary." (Sec. III.)

(*d*) To assess their salaries and expenses, which are unlimited. (Sec. III)

(*e*) To examine all books and papers of the various companies from time to time, in any manner that may seem to them necessary. (Sec. III.)

(*f*) To co-operate with, meet and consult with the Eastern Bureau with a view to secure a uniformity in operating the various lines represented in the two boards and to obviate any and all the discriminations of whatever *character*. (Sec. IV.)

(*g*) To abolish "all outside commission agencies of every nature and kind." (Sec. VI.)

(*h*) Jointly with the Eastern Bureau to determine questions arising out of rates for MIXED RAIL AND WATER TRANSPORTATION ON THE LAKES. (Sec. VII.)

In Sec. II. of the agreement reference is made to "the rates and *regulations*" established by the Commissioners; but nowhere do we find that it is their duty or that they are empowered to *make* regulations. It is easy to understand that if the Commissioners are to clean out the Augean stable, regulations or by-laws will have to be made from time to time, and if it was intended to give the Bureau the power of making such by-laws, the intent should have been expressed. This is important. For myself I do not think the Commissioners should have the absolute power, and I am pretty certain that very few managers will permit them to exercise such authority. Although the *making* of the regulations is ignored, it appears that arbitrary power of *enforcing* them is given to the Commissioners only in the case of "freight organizations," when in addition to "dismissal from the service" "the Commissioners SHALL prescribe such *other penalties* and the modes of enforcing the same as may be found necessary." This brings up the question of the power of railroad companies over freight organizations, such for instance as the Great Western Dispatch and even the Blue Line, unless all the roads in it are parties to the concordat. I shall watch a little curiously to learn what the "*other penalties*" will be. Wisely "the modes of enforcing" these "other penalties" are left to the Commissioners.

As regards the other powers, I doubt if many managers will permit the Commissioners to examine "all books and papers" in "*any manner* that may seem to them necessary." According to this the Commissioners may send for them, may take them away, or may go into an office and order the room to be cleared until the examination is finished. Such a regulation is preposterous. No one would consent to it. The officers signing the contract (if any did sign it) could not have understood what they were doing. A better phraseology is "the Commissioners shall have access to all records of through business transactions for the purpose of ascertaining," etc.

I wonder, too, if the contracting parties intended to give the Commissioners *carte blanche* in the matter of expenses, office staff, etc., and whether it was intended to assess the total expenditure of the Bureau on all the companies party to the contract *pro rata*, or whether the electors of each Commissioner were to pay his expenses and a proportion of the general expense. The former plan of course is the proper one, but in that case the salaries of the Commissioners should be paid by the general body and not by the local electors. The document says nothing about salaries.

Was it intended to give the Bureau power to abolish "all outside commission agencies of every nature and kind?" The document says so, but I apprehend that the contracting parties had no intention of permitting the power to be exercised literally; if not, they should have said only what they meant.

The power given "to determine questions arising out of rates for mixed rail and water transportation on the lakes" is a curious one. What questions are likely to arise out of rates? Where do we find mixed rail and water on the lakes? I always thought lakes were all water. Are we to understand that the Commissioners are not to regulate through rates over rail and water lines unless the water transportation was by Lakes Superior, Michigan, Huron, Erie and Ontario? Are other water routes to be ignored? Is it really intended that the Bureau is to "obviate any and all discriminations of whatever character?" What a glorious reform this is to be!

PENALTIES.—The Commissioners do not appear to be invested with any authority to inflict penalties on those parties to the contract who may violate its provisions; but the parties themselves agree that "in the event of any company or a connecting line failing to conform to the *regulations* prescribed by said Commissioners, and upon notice of such failure from the Commissioners, no through tickets or bills of lading WILL be received from or delivered to any line so failing to conform as aforesaid." The form of procedure in cases of violation is not laid down.

In sec. II. the parties agree that "in the event of any officer, agent or employe failing to conform to said rates and regulations, or violating them in any way, * * * upon the written complaint or requirement of said Commissioners, each of the companies parties hereto agrees and pledges itself to dismiss from its service any such officer, employe or agent." This is an absurd clause, the failure to conform may be owing to want of instructions, misunderstanding, etc. It may not be wilfull; but if the Commissioners become irate and insist on dismissal, what then? Again, if the company refuses to dismiss the employe or officer, no remedy is provided.

"The agreement may be modified at any time by a convention of *the officers* of the different companies parties hereto, all the companies being notified of the time and place of such convention, and two-thirds of the *officers or delegates* of all the companies being present and voting in favor of such modification or change." Of all the eleven slipshod sections of the document this one (sec. XI.) is the most carelessly or ignorantly drawn. When an agreement having in view the attainment of objects as important as this one appears to have has once been solemnly adopted, it should be surrounded by safeguards and protected from sudden attack of interested parties. The means by which its terms may be modified should be distinctly and completely detailed and should be such as would insure ample notice to all parties concerned and ample deliberation; but here we have a clause that permits the assemblage of a heterogeneous convention of all the *officers* or delegates at a moment's warning and without notice of the amendment to be proposed. The number of officers from each company who are allowed seats in the convention is not mentioned, nor is their rank nor the credentials requisite. In such a body it is easy to see how some companies could secure a predominance. The document does not fix the time that must elapse between the issue of the call and the assembling, nor even does it say who is to issue the call or at whose request a call must be issued.

Section 9. In the event of a disagreement by the Commissioners upon any point or question arising in their deliberations and duties, the decision of the majority shall be final and binding upon all the companies parties hereto. There are seven Commissioners. In the event of a disagreement the vote might stand four to three. In matters of mere detail such a majority might do; but are we to believe that the companies *said* to have signed the compact really intended that such a majority should decide important questions without appeal?

If they did and if they stand by it, they are traitors to the interests over which they are appointed guardians.

Section 5. "The companies parties hereto agree and pledge themselves to *require and exact* from all their connecting lines the rates established from time to time by the Commissioners, and IN NO EVENT *will they accept* from any connecting line, etc., any lower rates than are or may be established by said Commissioners," etc. Have the companies pledged themselves irrevocably that they will in *no event* accept lower rates than are fixed by the Commissioners? If so, I tell the gentlemen representing those companies that they undertook to do something *ultra vires*, and that by signing a document containing such an absurd clause they lay themselves open to the suspicion of having acted in bad faith.

So much for the things expressed in this piece of horrible composition. Many more criticisms might be made, but we have laid bare errors enough to damn the production. Faulty as it is in its construction, it is more so by reason of the omission of important provisions, for example:

1. Where are the Commissioners to be located?
2. Who are electors?
3. Where is the office of the Bureau to be located? The terms of the document do not limit the location even to a section of the country. It might be in New York as well as at Columbus, according to the contract.
4. What salaries shall be paid the Commissioners?
5. Who are to fix the salaries?
6. Are all to be paid alike and charged to the common fund?
7. What limit is there to the expenses of the Bureau; by whom is the limit to be fixed?
8. For what terms are the Commissioners appointed?
9. If a Commissioner neglects his duty—fails to attend meetings—what is the remedy?
10. What is to be taken as evidence of the qualifications of the Commissioners?
11. Who is to audit the accounts of the Bureau?

*Begging "Hindoo's" pardon, we do not and did not vouch for it. We published it as we found it in the newspapers which said it was a genuine document, but gave no authority for it.—EDITOR OF THE RAILROAD GAZETTE.

12. Are the Commissioners to make periodical reports or not?

13. If a Commissioner becomes obnoxious or neglects his duty how can he be impeached?

14. Are the Commissioners to exercise arbitrary power in the making of rates and *regulations?*

15. What limit is there to their power of making regulations?

16. Is there to be no appeal to any body from the decisions of the Commissioners?

17. When one company discovers that another is violating the compact, what is to be the form of procedure? *This should be clearly laid down to prevent reprisals and an immediate declaration of hostility.*

18. Who should issue the call for conventions when necessary?

19. How many days' notice must be given of conventions?

20. Who shall decide the place of convention?

21. Who shall have the right to demand the assembling of a convention?

22. In such conventions what companies may be represented? How many delegates may attend from each company? What credentials will be necessary to entitle a delegate to a seat?

23. For what period is the contract to hold good?

24. May parties to it give notice of intended withdrawal? If so, what notice must be given?

25. Does one withdrawal invalidate the compact?

26. What signatures are necessary to the completion of the contract? A clause defining this is requisite as a protection to the first signers.

If as Superintendent of a road my directors were to lay a copy of that agreement before me and ask my advice, I would say: "Gentlemen, my opinion is that you should not sign that paper, not because the object sought to be attained by it is a bad one, nor that our road would be injured by it, but because the agreement is so badly drawn that it offers no guarantee of protection to the parties that may sign it and honorably endeavor to carry out its provisions. It leaves open to designing parties loopholes through which we may receive annoyance. It affords to certain parties an undue representation, enabling them to command a majority on nearly all important questions. Finally, I should judge, by the careless drafting of the contract and the omission of many important provisions, that the originators were careful not to bind themselves, while they endeavored to bind others."

As a sample given to the world of the genius of our railroad magnates, it is one that brings them no credit, either for education or business talent. It is received generally as the production of Eastern men, and has been accepted meekly by Western managers, among whom are several persons who must be ashamed of it. Why do Western men copy the Eastern or acles? It is not long since I regretfully pointed out the adoption by Western managers of a farcical set of rules and regulations, the production of some Eastern presidents, who proclaimed aloud that they had now done "all that human foresight can suggest." HINDOO.

Maps "Guaranteed Correct."

ALTON, Ill., Oct. 26, 1874.

TO THE EDITOR OF THE RAILROAD GAZETTE:

In your issue of Oct. 17 I observed a note in regard to the immense value of an accurate map, and also referring to a map made by Mr. J. M. Goodwin, of Cleveland, Ohio, for the Lake Shore & Michigan Southern Railroad.

The expression that rather surprises me is that said to be on above map, viz.: "*this map is guaranteed correct.*"

I have noticed, more than once, Mr. Goodwin's articles in the GAZETTE and find them to be interesting and original, but in this case I fear that he has overstepped the mark, or that his idea of accuracy is the one in vogue, "correct *enough* for practical purposes." I should like very much to know Mr. Goodwin's degree of correctness, if there can be such an interpretation of the word correct.

In an experience of a number of years, in work that required a high degree of accuracy, I found that the only accurate men, or rather those *who possessed the knowledge* enabling them to work accurately, were some who had been in the Coast and United States River Surveys, and foreigners, who had been engaged in the Ordnance Surveys of France, Prussia and England. They were indeed few, and so slow, or, I should say, their methods so slow, that their work was rendered so costly as to place it beyond the power of railways or cities to employ them.

Now in the beginning of my remarks I had no intention of being sarcastic, but I am glad to learn that there is a professional engineer that produces work accurate enough to be called "*correct*," and if such is the case there is an immense amount of work to be done in *correct* surveys of our cities and accurate surveys of railroad properties in large cities, and also the exact delineation of valuable underground workings of mines.

In addition to a very few indeed possessing the requisite knowledge, the larger and main item after all is the cost of accurate surveys. Railroads and cities grumble enough now, when all our surveys are made with the chain, and quickly yet carefully; and when it comes to these accurate surveys I fear that the cost is too much for railroad companies to indulge much in such accurate work.

When an engineer can "*come forward*" and say confidently that he can and will *guarantee* to make a survey and map of a district in which his measuring in length shall not exceed an error of one and a quarter inches to the mile, and his angular error not be over five seconds of arc, or about 1.28 in. at a distance of a mile, and in addition to this can perform his work at a cost of not over 33 per cent. more than on ordinary "accurate" methods, such an engineer will be welcomed by thousands of railroads, mines and cities, and be scorned by dozens of lawyers who make their thousands out of our *present accurate* surveys, as they are commonly called. I would like to know something of Mr. Goodwin's method, which enables him to state upon a map that he "GUARANTEES IT TO BE CORRECT." This expression I have never seen upon any map, have never heard of its being upon a map before, and sincerely hope that there may be many surveys and maps made in the future on which can be written in large letters "Guaranteed correct." Such a thing, I will venture to say, can be done at *moderate cost*, but has there been any such done yet?

G. A. C.

A Table of External Secants and its Use.

WASHINGTON, October 27, 1874.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Inclosed you will find a table of external secants for a 1° curve, calculated up to an angle of intersection of 90°. It can easily be extended further, but will seldom be needed.

Below are a few cases to which it is specially adapted; others may be deduced by the engineer.

First.—To find the external secant of a curve: Divide external secant of angle I in table by degree of curve, quotient will be external secant required, which distance measured from P I will give point at middle of curve.

Second.—To find a tangent of a curve at its middle point: At P I deflect from either tangent an angle equal to one-half supplement of angle I, and measure external secant of curve. Set up instrument at this point, and turning 90° from P I will be on tangent. The curve can be run in the same as from P C.

Third.—To find what degree curve will pass through a given point, in direction toward the center: Measure from point to P I, and divide external secant of angle I in table by this distance; the quotient will be degree of curve required.

In using the table it is supposed that the angle I has been measured. T. W. JAYCOX, JR.

TABLE OF EXTERNAL SECANTS FOR A 1° CURVE.

Ang. I.	Ex. Sec.	P. P. I'.	Ang. I.	Ex. Sec.	P. P. I'.	Ang. I.	Ex. Sec.	P. P. I'.	Ang. I.	Ex. Sec.	P. P. I'.
0° 0'	0.00	.000	23	117.38	.175	46	494.81	.387	69	1222.73	.700
30	0.05	.005	30	122.63	.180	30	506.42	.39[illegible]	30	1243.73	.707
1	0.21	.009	24	128.02	.183	47	518.18	.398	70	1264.95	.717
30	0.48	.013	30	133.50	.187	30	530 14	.403	30	1286.46	.726
2	0.86	.016	25	139.11	.191	48	542.25	.408	71	1308.22	.735
30	1.36	.020	30	144.85	.196	30	554.49	.415	30	1330.27	.743
3	1.96	.024	26	150.72	.199	49	566 95	.420	72	1352.58	.752
30	2.68	.027	30	156.76	.205	30	579.55	.425	30	1375.16	.762
4	3.49	.031	27	162.79	.208	50	592 31	.431	73	1398.03	.772
30	4.41	.035	30	169.05	.212	30	605.26	.438	30	1421.20	.782
5	5.47	.038	28	175.41	.216	51	618.39	.444	74	1444.65	.791
30	6.60	.042	30	181.89	.220	30	631.71	.449	30	1468.38	.801
6	7.86	.045	29	188.50	.225	52	645.18	.454	75	1492.42	.811
30	9.22	.049	30	195.25	.229	30	658.82	.461	30	1516.75	.821
7	10.70	.053	30	202.12	.233	53	672.66	.467	76	154 .39	.831
30	12.29	.056	30	209 12	.238	30	686.69	.473	30	1566.32	.842
8	13.98	.061	31	216.25	.241	54	700.88	.480	77	1591.58	.85
30	15.80	.064	30	2 3.50	.246	30	715.28	.486	30	1617.15	.863
9	17 72	.068	32	230.89	.251	55	729.85	.492	78	1643.03	.874
30	19.75	.071	30	238.42	.255	30	744.62	.498	30	1669.25	.885
10	21.89	.075	33	246.08	.259	56	759.58	.505	79	1695.80	.896
30	24.15	.078	30	253.86	.265	30	774.72	.511	30	1722.66	.907
11	26.49	.083	34	261.81	.268	57	790 06	.518	80	1749.86	.919
30	28.98	.8	30	269.86	.273	30	805.62	.525	30	1777.44	.930
12	31.56	.090	35	278.05	.278	58	82 .36	.533	81	1805.35	.942
30	34.25	.094	30	286.39	.282	30	837.33	.538	30	1833.60	.953
13	37.06	.098	36	294 86	.287	59	853.45	.546	82	1862.20	.96
30	40 00	.101	30	303.48	.291	30	869.83	.552	30	1891.18	.979
14	43.03	.105	37	312.21	.297	60	886.38	.559	83	1920.55	.990
30	46.18	.108	30	321.12	.301	30	903.15	.567	30	1950.25	1.004
15	49.43	.113	38	330.15	.305	61	920.15	.573	84	1980.37	1.016
30	52 82	.116	30	339.31	.311	30	937.35	.580	30	2010.84	1.026
16	56.31	.120	39	348.63	.316	62	954.75	.588	85	2041.70	1.042
30	59.90	.124	30	358.11	.320	30	972.40	.594	30	2072.97	1.056
17	63.63	.128	40	367.71	.325	63	990.23	.602	86	2104.65	1.070
30	67.46	.132	30	377.48	.330	30	1008.31	.610	30	2136.75	1.083
18	71.42	.135	41	387 38	.335	64	1026.63	.618	87	2169.25	1.096
30	75.48	.139	30	397.43	.340	30	1045.16	.626	30	2202.15	1.111
19	79.66	.144	42	407.65	.345	65	1063.93	.633	88	2235.49	1.128
30	83.98	.147	30	417.98	.350	30	1082.93	.641	30	2269.33	1.140
20	88.39	.15[illegible]	43	428.49	.355	66	1102.18	.649	89	2303.51	1.156
30	92.92	.155	30	439.16	.361	30	1121.65	.657	30	2338.17	1.171
21	97.58	.159	44	449.98	.366	67	1141.35	.666	90	2373.29	
30	102.35	.163	30	460.95	.371	30	1161.35	.673			
22	107.26	.167	45	472.08	.376	68	1181.55	.682			
30	112.25	.171	30	483.36	.382	30	1202.01	.691			

Novel Railroading—The Slowest Train.

SOUTHBRIDGE, Mass., October 29, 1874.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I am interested in informing you of some very heavy railroading on a country road across the hills. The city of Providence, R. I., is receiving some very heavy castings from Cold Spring, N. Y., for the Pontagensett Water Works, four miles from the city, and 3½ miles from the nearest railroad station, which is Pontiac, on the Hartford, Providence & Fishkill Railroad. Here they leave the railroad and are to be taken across the country. This difficulty is placed in the hands of Mr. W. A. Lovell, of Boston, the well known locomotive express proprietor of that city. The route from the station is over a crooked and hilly country road. The worst hill is nearly half a mile in length, very crooked, and full of shoulders or waterbars, the average grade of which is one foot in twelve and in places much greater. The decision of the way and means of transportation was to move cars and all together, and to employ oxen as the motive power. The first shipment arrived two weeks ago and consisted of three cars loaded with 86 tons, or 28⅔ tons to each car. The force of men is 10 (including two sailors to manage the ropes) and six yoke of oxen, also a combination of 27 sheaf tackle blocks, and two-inch ropes, and a succession of skid tracks. Each skid contains two lengths of rails firmly spiked to string pieces six inches square, and these firmly secured by heavy cross bolts and ties, making a portable railroad track. Each car was moved separately for a distance of perhaps 500 yards, and then each succeeding car in its order, moving the skids for each car. It is a slow process but a sure one. In ascending the hills it requires a man to each wheel with a large wedge to prevent further accident in case the rope should break. The time taken in moving the train 3½ miles was a little over two weeks, and it will require about three days to make the return trip. The first trip was performed with good success, there being no delays on account of freight bills or hot boxes. The cars employed were low flats—Lovell's locomotive transportation cars. The next shipment will be a much heavier one, if not a more difficult one to move, and is expected to arrive soon. One car alone contains a casting weighing 60 tons.

GEO. A. HAGGERTY.

The Oroya Railroad in Peru.

LIMA, Peru, October 14, 1874.

TO THE EDITOR OF THE RAILROAD GAZETTE:

About the middle of September the regular passenger train to San Mateo was placed on this road, making 66½ miles of the road now opened to public travel. This place is at an elevation of 1,000 feet above the sea, and the running time from Lima is six hours. The track is now laid 5½ miles further to "Infiernillos" Bridge (of 170 feet span, joinning two tunnels) the erection of which is now being commenced. This bridge with three others—all of the Phœnix column pattern—have just arrived from the United States.

English, French and American bridges have had a full and fair trial on this road, and the result is that, after paying steamer freight from New York to Aspinwall, unloading and shipping across the Isthmus by rail, reloading at Panama and shipping by steamer on the Pacific (where steamer charges are fearfully high) when finished, American bridges are the cheapest by a striking difference. English and French bridges are shipped in sailing vessels around Cape Horn, thus obtaining cheap freights and avoiding Isthmus charges.

If account were made of the loss, in cost of mule transportation of supplies and railroad material and implements in advance of the bridges while erecting, the difference would be much greater, as the American bridges require but a fraction of the time needed to rivet the others together.

A bridge worthy of mention is a French bridge at Challapa, 52 miles from Lima. There are two spans of 92 feet each, and one of 182 feet, one pier 56 feet high, another 63 feet. The bridge is of wrought iron, on the lattice plan, truss and piers. The chasm it crosses is 115 feet below the rail. The American bridge at Chaupichaca is a larger and finer one, but I have not the details at hand.

Of the 63 tunnels now known of the line (some others are undecided on as yet) 27 are finished, of an average length of 310 feet each; 20 of the remaining ones, of an average length of 445 feet, are working. Of these, 6,780 feet of heading was completed October 1, 1,315 feet being done in September.

The summit tunnel at Galera Pass, 16,450 feet above sea level, is being pushed forward vigorously. Of the 3,820 feet of its length, 2,840 feet of heading was completed September 1. The breast is being taken out as rapidly as possible and arching, where necessary, being put in. The material of the tunnel is mostly composed of disintegrated rock from the high mountain peaks on either side of the pass, making it necessary to arch about two-thirds of the length of the tunnel.

On account of the great cost of delivering fuel at this place, the irregularity of supply, as well as the uncertainty of results from its combustion, or from other reasons of which I am not aware, the compressing of air by steam to work machine drills was abandoned and hand drilling is used exclusively, and the steam made is used only to work the fans of the Sturtevant blower for supplying the tunnel with fresh air. These were first constructed for forcing fresh air *into* the tunnel, but better results were obtained by reversing them and using them as exhausts to draw the foul air out.

It is expected to have a meeting of the two headings by April, 1575. The wiseacres of this vicinity are speculating considerably on some curious philosophical questions expected to be solved by its completion.

A very ingenious and effective appliance for machine drilling is in operation at Rio Blanco. It was built in the shops of the road here under direction of Nathan Crowell, Master Mechanic. By referring to your issue of July 26, 1873, you will see (map 4) several tunnels noted. Where the road makes the return in crossing Rio Blanco are located on a single foundation four of Rand & Waring's air compressors on a single shaft, connected by bevel gearing to two of Leffel's 30½ inch Turbine water wheels. The wheels are supplied with water from a 30-foot head, conducted 140 feet through a wrought-iron pipe of ⅛ in. iron 4 ft. 8 in. in diameter, where it branches off into two pipes, one leading to each wheel, each pipe being 60 feet long, 2 ft. 8 in. in diameter and at an inclination to the horizontal of 20°.

The compressors, each of 12 inches diameter and 30 inches stroke, run at 70 strokes to the minute, the water wheel making about 270 revolutions, developing about 250 horse power. The penstocks are of wrought iron, made in the shops here. The density of the atmosphere at this elevation is about 11 lbs.

It is designed to supply compressed air to two headings from it at once, with two diamond drills in each heading. From its location it can supply all the tunnels in its vicinity, by continuing the pipe from the compressors. It was claimed by the manufacturers of compressors—so I am informed—that the rarity of the air would make no difference in the working; the exhaust being so much easier, so much less air would have to be compressed, and the same ratio of compressors to power needed for drills could be preserved as at sea level. It is found by their work here that one-third or one-half more compressor capacity to drill power is needed than at sea level.

Giant powder has proved so greatly superior to others (nitroglycerine has not been used) that it is used almost exclusively. Its force is several times that of ordinary blasting power. In the hardest rock—such as porphyry, granite, quartz with iron band—it often tears a hole in the rock deeper than the drill hole.

It will be recollected that all this machinery was made in

pieces of less than 300 lbs. weight, packed carefully in boxes, then packed many miles on mules over many places where I have known travelers to dismount and walk rather than trust to their mules to bring them through.

The operation of the affair has been most successful, the only delay being occasioned by being out of diamonds for the drills occasionally, or from want of giant powder. We are at a long distance here from a base of supplies, and renewals of orders are not easily obtained.

W. H. Cilley, Esq., the very energetic Superintendent, informs me that a grading force is now at work over all the line between Rio Blanco and the Summit. M. Van Brocklin, Resident Engineer, makes himself useful by living where this work is doing and seeing that it is pushed. At the present rate of progress the road across the Andes will be an accomplished fact in a year more. When the locomotive gets to the summit the work will be about over, as the 30 miles of grading east of it has been finished for two years.

Criticism of "Farmer's" Solution of a Problem in Location.

LOUISVILLE, Ky., October 27, 1874.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your issue of the 24th inst. two (so-called) solutions of "W. W. H.'s" problem in GAZETTE of the 3d. The last (or No. 2, by Mr. Long) is correct, and as compendious as possible to be correct. But *solution* No. 1 is certainly by a "Farmer." In the first place he assumes that "the side $B\,H$ and the angles B and H are known by notes of located line." This is an error; for although the angle at H is readily known, "by notes," when we know radius and length of curve; yet his side $B\,H$ is not known necessarily, without some figuring, as all curves are not run in by connecting tangents and then calculating back to a P. C. Of course I can anticipate his reply, that if intersection point was not known it could be calculated. But what shall we say to his position of "B"? He says: "The side $B\,G$ and the angle G are shortly obtained." But there is no side $B\,G$ in the problem. There is, or might be, a side $F\,G$, as in figure No. 2. It is evident that "Farmer" calculated to turn off at B in the direction $B\,G$ with an angle (as he would with a farm wagon, at Farmwell) instead of continuing his curve. Then his advice, "in many cases, etc.," might do for a green rodman; but to take pains to give such advice, when the *problem* is what we want to get at, is perfectly puerile.

G. C. B.

General Railroad News.

ELECTIONS AND APPOINTMENTS.

—Mr. C. H. Hudson, for some time past General Superintendent of the Chicago, Dubuque & Minnesota and Chicago, Clinton & Dubuque roads, has been appointed Assistant General Superintendent of the Chicago, Burlington & Quincy, and will have his office in Chicago. Mr. Hudson was formerly Superintendent of the Chicago Division and Superintendent of Machinery. Mr. Charles Harris succeeds Mr. Hudson in charge of the River roads, which will be worked by the Chicago, Burlington & Quincy.

—It is reported that Mr. J. P. Farley, President of the Dubuque Southwestern and Receiver of the St. Vincent Extension, St. Paul & Pacific, has been offered the position of Superintendent of the Iowa Division of the Illinois Central.

—In the foreclosure suit brought by the Osterberg, or German party, the United States Circuit Court has appointed W. H. Ferry Receiver of the Rockford, Rock Island & St. Louis Railroad.

—Mr. Philo T. Ruggles has been appointed Receiver of the New York, Housatonic & Northern Railroad Company.

—The Upper Mississippi Navigation Company at its annual meeting in St. Paul, Minn., recently, elected the following officers for the ensuing year: President, Henry T. Wells; Vice-President, Richard Chute; Secretary and Treasurer, A. B. Barton.

—At the annual meeting of the Danbury & Norwalk Railroad Company in Norwalk, Conn., October 29, the following directors were chosen: R. P. Flower, H. H. Hollister, W. C. Street, W. K. James, James W. Hyatt, Orrin Benedict, L. P. Hoyt, D. P. Nichols, E. S. Tweedy. The board elected officers as follows: President, R. P. Flower, New York; Vice-President, James W. Hyatt, Norwalk, Conn.; Superintendent, John W. Bacon, Danbury, Conn.; Secretary and Treasurer, H. Williams, Danbury, Conn.; Executive Committee, W. C. Street, H. H. Hollister, Orrin Benedict; Auditing Committee, D. P. Nichols, E. S. Tweedy, L. P. Hoyt.

—The United States Circuit Court has appointed Messrs. J. F. Alexander (a director and treasurer of the company) and St. John Boyle Receivers of the St. Louis & Southeastern Railway on application of the trustees under the mortgage.

—At the annual meeting of the Detroit, Eel River & Illinois Railroad Company at Columbia City, Ind., October 29, the following directors were chosen: James S. Collins, Columbia City, Ind.; J. L. Davis, Auburn, Ind.; G. E. Adams, D. D. Dykeman, Logansport, Ind.; D. L. Quirk, E. F. Uhl, Ypsilanti, Mich.; C. H. Buhl, T. B. Buhl, James F. Joy, A. Sheldon, Detroit, Mich.; W. W. Crapo, New Bedford, Mass.

—At the annual meeting of the Camden & Atlantic Railroad Company in Camden, N. J., October 27, the old board of directors was re-elected, as follows: Andrew K. Hay, Winslow, N. J.; Samuel Richards, Atco, N. J.; C. R. Colwell, Weymouth, N. J.; E. A. Doughty, Absecom, N. J.; S. C. Cooper, J. R. Dayton, Thomas H. Dudley, Camden, N. J.; Anthony T. Antelo, W. D. Bell, C. Camblos, John Lucas, W. Massey, J. S. Newbold, Philadelphia. The board re-elected Andrew K. Hay President and D. M. Zimmerman Secretary and Treasurer.

—Mr. Daniel Atwood has been appointed General Freight Agent of the Green Bay & Minnesota Railroad in place of W. S. Mellen, who has gone to the Winona & St. Peter.

—Mr. F. W. Clark, now Assistant General Freight Agent of the Atlantic Coast Line, has been appointed General Freight and Ticket Agent of the Carolina Central Railroad.

—Mr. J. F. Mackey, Division Superintendent of the Middle Division of the New York & Oswego Midland, has been appointed Superintendent of the Northern Division in place of Caleb Hulse, resigned.

—Mr. George F. Netherland, Superintendent of the Eastern Division of the Chesapeake & Ohio Railroad, has been appointed also Master of Transportation for the whole road.

—Mr. Thomas P. Shaw has been appointed Paymaster and Freight Accountant of the Maine Central Railroad in place of F. E. Boothby, lately appointed General Ticket Agent.

—Mr. R. McDougall has been appointed Master Machinist and J. T. Booth Master Car-Builder of the Mobile & Ohio Railroad in place of B. S. Skates and Jacob Huy.

—Mr. Charles S. Williams has been appointed Superintendent of the Pensacola & Louisville Railroad in place of L. H. Sellars, who has gone to the New Orleans, St. Louis & Chicago.

—The new board of directors of the Western Maryland Railroad Company has re elected the old officers as follows: J. M. Hood President and General Manager; Alexander Rieman, Vice-President: John S. Harden, Secretary and Treasurer.

—Mr. E. K. Sibley has been appointed Assistant General Freight Agent of the St. Louis, Iron Mountain & Southern Railroad Company, with office at St. Louis. Mr. J. C. Zimmer has been appointed Division Freight Agent for the Arkansas Division, with office at Little Rock, Ark., to succeed Mr. J. C. Sibley, promoted.

—At the annual meeting of the Indianapolis, Cincinnati & Lafayette Railroad Company in Indianapolis, November 2, the following directors were chosen: M. E. Ingalls, S. P. Broadwell, Cincinnati; Wm. F. Reynolds, M. Fowler, T. H. Perkins, Boston; George Bliss, W. A. Booth, J. F. Kennedy, C. J. Langdon, New York city. The new Board elected the following officers: M. E. Ingalls President; C. H. Booth, Secretary; F. Osborn, Treasurer.

—At the annual convention of the Railroad Conductors' Life Insurance Association in St. Louis, Oct. 28, the following officers were chosen for the ensuing year: J. W. Seymour, Illinois Central, President; M. Spain Jay, First Vice-President; John C. Blood, Second Vice-President; J. F. Culbertson, Columbus, O., Secretary and Treasurer; John W. Moore, R. J. Snively and John Dakin, Executive Committee.

PERSONAL.

—Mr. C. Harris has resigned his position as Superintendent of the Wisconsin Central Railroad to take charge of the Chicago, Dubuque and Minnesota and Chicago, Clinton & Dubuque roads. Mr. Harris was formerly Superintendent of the Chicago Division of the Lake Shore & Michigan Southern.

—Mr. John W. Ulm has resigned his position as Superintendent of the Des Moines & Minnesota Railroad.

—Mr. D. B. Grant, President of the Grant Locomotive Works, sailed for Europe, October 31, to arrange the affairs of the company with regard to the Russian contract.

—The Springfield *Republican* says: "It is at least premature to say that Mr. Chester W. Chapin intends to resign the presidency of the Boston & Albany Railroad Company at the end of this year. He has contemplated, for some years, withdrawing from the active management as soon as possible, but no time is fixed, and none can well be now, for doing it. It isn't a place to be filled any day, or by any man."

—Mr. A. N. Towne, General Superintendent of the Central Pacific Railroad, completed his fifth year of service in that capacity on the 1st of September last. At the beginning of that period the company owned 690 miles of railroad; now it has 1,219, and controls about 500 more, which is under Mr. Towne's management. The receipts of the roads under Mr. Towne's charge during these five years have been a little more than $56,000,000, which has been earned at an average expense of 43 per cent, being last year only 40 per cent.

—The residence of Mr. Conrad Shoemaker, Superintendent of the Syracuse & Chenango Railroad, at Manlius, N. Y., was burned on the night of October 31. The loss is estimated at $17,000, on which there is an insurance of $13,000.

—Mr. George W. Ogilvie, General Freight Agent of the Des Moines & Fort Dodge Railroad, was married to Miss Mary L. Burton, at Bentonsport, Ia., October 22.

TRAFFIC AND EARNINGS.

—The earnings of the Great Western Railway of Canada for the week ending October 9 were: 1874, £22,118; 1873, £24,873; decrease, £2,755, or 11¼ per cent.

—The earnings of the Grand Trunk Railway for the week ending October 10 were: 1874, £49,000; 1873, £48,400; increase, £600, or 1¼ per cent.

—The earnings of the Western Maryland Railroad for the year ending September 30, 1874, were as follows:

Earnings ($3,087 per mile)	$277,792 24
Expenses (70 per cent.)	194,442 38
Net earnings ($926 per mile)	$83,349 86

—The earnings of the Denver & Rio Grande Railway for the third week in October were: 1874, $7,481; 1873, $8,403; decrease, $922, or 11 per cent.

—The earnings of the Michigan Central Railroad for the third week in October were: 1874, $154,342; 1873, $144,461; increase, $9,881, or 6⅞ per cent.

—The earnings of the St. Paul & Sioux City for the month of September were: 1874, $86,743; 1873, $93,629; decrease, $6,886, or 7¾ per cent.

—The earnings of the St. Louis, Iron Mountain & Southern Railroad for the third week in October were: 1874, $83,150; 1873, $64,574; increase, $19,576, or 30¼ per cent.

—The earnings of the Toledo, Wabash & Western Railway for the third week in October were: 1874, $106,115; 1873, $116,287; decrease, $10,172, or 8¾ per cent.

—The grain movement at the six Western lake ports, St. Louis and Peoria for the week ending Oct. 24, amounted to 150,011 barrels of flour and 3,765,800 bushels of grain of all kinds against 150,448 barrels of flour and 4,006,800 bushels of grain the previous week and 147,448 barrels of flour and 4,453,200 bushels of grain for the corresponding week of 1873. The great decrease since last year is in corn, which is 40 per cent. less, but in the minor items of oats and barley the decrease is about 25 per cent.

—Of the flour and grain shipments eastward from the Western lake ports for the week ending Oct. 24, 57 per cent. of the flour, 5¼ per cent. of the wheat, 15½ per cent. of the corn and 27 per cent. of the oats went by rail.

—Of the grain shipments from Buffalo for the week ending Oct. 24, 33 per cent. went by rail.

—The shipments of iron ore from the Lake Superior region, from the opening of navigation up to October 29, were as follows:

	1874.	1873.
Marquette, tons	400,511	507,516
Escanaba	257,318	464,623
L'Anse	83,434	64,410
Totals	741,263	1,036,549

Decrease this year 295,286 tons, or 28½ per cent. The pig-iron shipments for the same period were:

	1874.	1873.
Marquette, tons	23,434	23,084
Escanaba	13,253	8,362
Grand Island	9,768	....
Totals	46,455	31 446

Increase this year, 15,009 tons, or 48 per cent.

—The Buffalo *Commercial Advertiser* gives the following statement of the receipts of flour and grain at that city for the ten months ending November 1:

	1874.		1873.	
	Flour.	Grain.	Flour.	Grain.
By railroad	1,489,812	23,025,029	.....	18,866,100
By lake	1,139,799	50,136,221	954,789	57,930,366
Totals	2,629,611	73,161,250	954,789	76,796,466

The railroads thus brought about 56⅛ per cent. of the flour and 31⅛ per cent. of the grain this year, and 24⅛ per cent. of the grain in 1873.

The shipments of grain eastward for the same period were:

	1874.	1873.
By canal, bushels	37,986,867	44,753,924
By rail	9,711,701	7,916,766
Totals	47,698,568	52,670,690

Rail shipments were 20⅓ per cent. of the whole in 1874 and 15 per cent. in 1873.

—The receipts of canal tolls on the Erie Canal at Buffalo, from the opening of the season up to November 1, were: 1874, $1,153,525; 1873, $1,277,487; decrease, $123,962, or 9¾ per cent. The number of boats cleared was: 1874, 6,980; 1873, 8,132; decrease, 1,152, or 14¼ per cent.

THE SCRAP HEAP.

An Incident of Travel.

Mr. Max Adeler, of Pencadder Hundred, Del., relates the following, for the truth of which he is prepared to vouch:

"Mortimer J. Loomis is now one of the most violent of the denunciators of railroad monopolies. Since his last adventure on the cars he hates a railroad worse than an Arrapaho Indian hates a bald-headed Shaker. Loomis has fits of somnambulism occasionally, and at such times he has an uncontrollable tendency to wander into dangerous places. More than once he has been surprised, upon waking to find himself roosting on the comb of the roof, or hanging head foremost down the well with one leg around the bucket handle. He went out to Pittsburgh a few days ago, and when he entered the sleeping-car the thought struck him that he might get to prowling about during the night while asleep and walk off the platform into the better world. So he went to the brakeman and gave him a dollar, with strict instructions that if he saw him walking around that car in his sleep to seize him and force him back at all hazards. Then Loomis turned in. About two o'clock Loomis awoke, and as the air of the car seemed stifling, he determined to go out on the platform for a fresh breath or two. Just as he got to the door the vigilant brakeman saw him, grabbed him, floored him and held him down. When Loomis recovered his breath he indignantly exclaimed, 'You immortal ass! What'd you mean? Lemme get up, I tell you! I'm as wide awake as you are.' But that myrmidon of a grasping corporation put another knee on Loomis' breast and insisted that Loomis was asleep; and then he called another brakeman, and after a terrific struggle, during which Loomis received bumps and blows enough to wake an Egyptian mummy that had been dead for six thousand years, the railroad man jammed him into a berth, put a trunk and eight carpet bags on him, and then sat on him until eight o'clock in the morning. The first thing Mr. Loomis asked for when he arrived at Pittsburgh was a respectable hospital where they cured the temporary insane. He thinks his reason was partially dethroned by his effort to comprehend how that brakeman could have the face to ask him for another dollar because of the trouble Loomis gave him during the night."

Keeping a Fireman Busy.

The Burlington (Ia.) *Hawkeye* is of the opinion that when a locomotive engineer, finding himself laid out on a side track for the greater part of the afternoon, wiles away the monotony of the occasion by sending his new fireman back to the next station to look after the exhaust which he claims to have lost while coming up the hill, it may be safely considered as a base attempt of a brotherhood man to put a damper on rising genius.

A Brakeman's Complaint.

It is a brakeman this time that comes before the public with his special grievance. People have found fault with the way in which he shouts at the car door the name of the next station. The harder he tries and the more he exercises his lungs, the more fault is found, and at last, worried beyond endurance by this perpetual fault-finding, he rushes into print and indignantly demands to be informed whether the public expects to get a first-class tenor voice for $40 a month.

Railroad Manufactures.

The iron rail mill of the Joliet Iron & Steel Company started up October 26.

The Schenectady (N. Y.) Locomotive Works have resumed work with a small force.

The Allegheny Car & Transportation Company has erected new brick buildings to replace the wooden ones destroyed by fire last spring. The machinery has all been replaced or rebuilt, and the company is ready to start.

The Pittsburgh & McKeesport Car Company has bought land at McKean Station, Pa., a mile from McKeesport, and purposes moving its shops to that point.

The puddling mill of the Rome (N. Y.) Iron Works will be started up this week. Work in the rail mill was resumed October 29. The directors have decided to run the mill all winter and pile the rails in the yard, if the employes will consent to a reduction of wages. This action is solely taken in the interest of the employes, as there is no immediate prospect of selling the rails made.

The Pennsylvania Steel Company, Baldwin, Pa., has declared a dividend of 8 per cent.

The Pittsburgh *American Manufacturer* says: "The Otis Iron & Steel Company, Cleveland, will make a trial this week of their machinery. They have two very fine engines, made by McIntosh & Hemphill, of Pittsburgh, a pair of shears by Marchand & Morgan, of Alliance. They are said to be the largest ever made in this country. They have two large trains, including a three-high, and have plenty of room for more rolls when needed. This company do not propose to make rails now, but can arrange to do so at any time. The buildings are first-class, being of brick."

Prices of Rails in October.

Bigelow & Johnson report foreign iron at $48 to $49 gold in New York, and American at $55 to $60 currency; foreign steel at $82 to $83 gold and American at $80 to $83 currency; old rails are quoted at $30. There were no imports of iron at New York during the month, as there have not been during the year, though there were 41,449 tons imported during the ten months in 1873. The imports were 3,427 tons in October and 68,485 tons during the ten months this year against 80,574 for the corresponding ten months in 1873. The firm say:

"*New Rails.*—Foreign remain as last quoted, there being little or no demand. In American, some thousands of tons have been placed on terms not made public, but all more or less on long credit. Steel rails have been very quiet, but there are some transactions pending.

"*Old Rails* have moved more freely, but at a decided reduction in rates. As low as $27 has been accepted for Western delivery. The quotation for D. H. in our last should have been £4 17s. 6d. f. o. b. London, instead of £4 7s. 6d. This is still the price there. Our stock of foreign is now about exhausted."

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Editorial Announcements.

Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

CLASSES OF PASSENGERS.

The Midland Railway Company of England has recently determined to cease running second-class carriages on its road, and to adopt for its first class a rate of 1½ pence per mile, which is less by about one-fourth than the average first-class fare heretofore, and nearly the same as the second-class rate. The "third-class" fares, as the company continues to call them, remain at about a penny a mile; these charges are equivalent in our currency to just about 3.3 and 2.2 cents per mile, and the first-class rate is considerably higher than that of the chief Eastern roads in this country, and about equivalent to that of those roads in the interior and Northwest which have the heaviest traffic.

The announcement of this revolution in passenger traffic has attracted comment from nearly all the English newspapers, and has had a decided effect on the London railroad stock market, causing a decided pressure to sell, which forced prices down considerably, thus indicating that the great body of railroad proprietors feared that the results of the new departure would be disastrous at least at first, while the tone of the discussion in the newspapers indicates a prevalent feeling that a true first-class, as it has so long existed in England—a high-priced class and exclusive because it is high-priced—is needed in that country; that a first-class which includes the present second-class will have the cars unpleasantly crowded, and often with people whose presence will be disagreeable to well-bred ravelers and especially to ladies traveling alone. This is more intelligible when we call to mind that the English first-class cars are of smaller capacity than the other classes, and especially that they are rarely filled, and frequently contain but two or three passengers, while, if what we read is true, a fee to the "guard" will often secure a whole compartment to a single traveler or to his party. Moreover, though English passenger-cars are very much smaller than ours, there is really much less privacy in them, owing to the fact the seats face each other, and the traveler in a full car looks into the faces of a dozen of his fellow-travelers, whereas in our cars holding more than fifty passengers, all face in the same direction, and one can see faces only by turning around and looking backward. Thus we usually find that Americans who have traveled in England prefer our long cars for privacy even to the half-empty first-class carriage of the English roads.

We imagine, however, that the change made by the Midland is not so revolutionary as it appears. This company has been the pioneer in introducing American parlor and sleeping cars into England, and the parlor cars are provided with compartments smaller even than those of the English first-class. It would seem to us that the change is not so much an abolition of the second-class as a substitution of luxurious American cars for the present English first class, and a change of name of the old second class to first class. If this is the case, the merits of the change will depend upon the relative advantages of American parlor and sleeping cars and English first-class carriages. On general principles we should say that such a change would be advantageous to the railroad company. The American and the English cars are alike in being luxuriously fitted and requiring a large yearly expenditure for the maintenance of their interiors and alike also in running for the most part with much fewer than their full complement of passengers; but the American cars are very much heavier, both per wheel and per passenger accommodated, than anything known in England heretofore; and, though extremely well liked by travelers and often affording them a great saving in working time, they are on the whole anything but profitable to the railroad companies, which in many cases, we are sure, if not in most, do not receive the bare cost of carrying passengers in heavy sleeping and parlor cars.

But if it is intended really to suppress one of the three classes on the Midland Railway, (and existing on nearly every European railroad), it is not difficult to imagine a motive for the step, for it is towards simplicity in working, which is essential to the greatest economy, but not sufficiently appreciated, we believe. American railroad men may not at once understand the complexity occasioned by running several classes of passenger cars in one train, but they may gain a better idea of the advantages they have over the European system by imagining the troubles and expenses which could be avoided if it was possible to conduct the freight traffic in a single class of cars—if the cars which bring cattle from the West could take back merchandise from the East, and the long trains of coal cars after dumping their cargoes of fuel could take back a load instead of being hauled empty. Every train must be supplied with capacity for accommodating a possible increment of passengers whose number is unknown; if in addition the unknown number of passengers are of unknown classes, or the proportions of each class are unknown, the additional car capacity must be in at least three different cars. Here, if seating room for thirty in a train of three cars is sufficient on starting from terminus, it will be provided by leaving one car half empty. But in England, under similar conditions, there might be one third-class and one second-class car full, and a first-class half full, and then the necessary provision could be made only by attaching two additional cars. This complexity occasioned by multiplying classes is a serious obstacle to the economical conduct of traffic, and the only one, we are inclined to believe, which is a sufficient objection the non-introduction of a true second-class on all but the fastest American trains. That even this is a sufficient objection, we are not prepared to say, but it is certainly a solid and a formidable one. Quite possibly the simplification from three classes to two, and the abolition of a class of cars which usually run not half full, may prove a real economy to the Midland Railway, aside from any increase of traffic, which latter, however, is not likely to prove considerable, because the Midland's competitors will be compelled to adopt substantially its rates, and the class of people who would be tempted to spend more time in railroad travelling is not to any extent composed of those who have heretofore travelled first class. But we believe that there have been suspicions in England heretofore that the profit on first-class passengers, when the special expenses due on their account are properly considered, are less than on second-class, so that the decreased receipts from this class may be balanced or more than balanced by the decreased expenses; for, even if the company maintains its first-class carriages fully in the old style (which is by no means certain), we may be certain that the reduced price will keep them as full as the second-class cars have been heretofore, and the greater part of the extra expense of luxurious cars, in this country as well as in England, comes from the little work they do much more than from their costly fittings.

There is another aspect in which this change can be viewed which is noticed by *The Economist* (one of the ablest of all periodicals in the discussion of economical subjects), and that is its effect on the business of passenger transportation on competing lines and almost throughout England. In this way the company may, while affecting its own traffic but slightly, decrease by an immense amount the passenger earnings of other English railroads. The Midland, indeed, depends upon passenger earnings for its income much less than most English railroads, in that resembling more nearly the average American railroad; then of its passenger earnings the portion from first-class passengers is unusually small. For the first half of 1874 this part was less than 16 per cent. of its passenger earnings, while the London & Northwestern's were 25 per cent. and the Great Western's 21 per cent. The Midland's passenger earnings are, we believe, less than one-third of its total income, so that its first-class earnings have been only about 5 per cent of its total receipts, and a decrease of them by one-quarter would take but 1¼ per cent. from the gross income, so that if there were absolutely no decrease in expenses attending the change, the loss would be by no means disastrous. On the other hand a railroad with half its income from passengers and a quarter of that from first class, would lose more than three per cent. of its receipts by a similar change, a portion large enough on many roads to make a sensible decrease of the sum available for dividends. And as this movement of the Midland is likely to compel a similar reduction on at least five or six other railroads, and perhaps even make it general in England, we can see how what would cost it £25,000 in gross income might take half a million or more from its neighbors. This is one of the incidents to free competition in railroad transportation. As we see so often in this country, the efforts of an inferior circuitous route to make a profit of fifty thousand dollars costing its competitors as much as a million; so a trifling sacrifice by one corporation may bring disasters upon its neighbors. There is a certain "solidarity" in railroad transportation which heretofore in countries where competition is free seems to have been manifested in disaster rather than in prosperity.

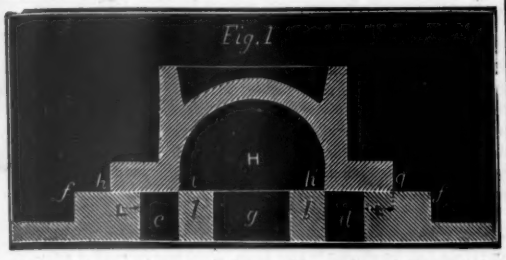
In the case of the Midland, whose income is chiefly from freight, it is reported that its competitors contemplate threatening its prosperity by reducing freight rates to points at which it competes, so that in a few months we may see a group of English railroads letting out their own blood for the sake of hurting a rival in the fashion so familiar in this country. This, of course, is on the supposition that the change involves a loss in net income, which, as we have said, seems to us by no means certain. It was the Midland which, two years ago, introduced third-class cars on fast trains, which practice immediately became almost universal, and has not been found disadvantageous apparently. Perhaps the new movement may prove both popular and profitable, though so much feared at first.

SLIDE VALVES.

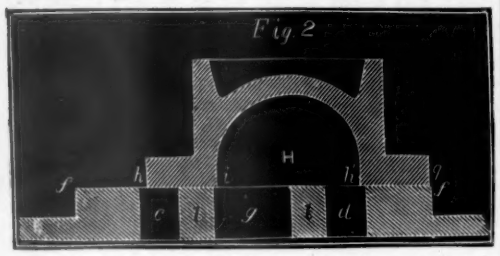
Probably no part of a locomotive engine has been the subject of more thought and discussion than the ordinary D slide valve. Its proportions have been discussed in elaborate treatises, and hardly a fireman or locomotive runner but has speculated over lap, lead and travel. Its movements and functions have been analyzed by profound mathematicians with the aid of the most elaborate formulæ and calculations, and every apprentice in a locomotive shop is prepared to discuss its working, although armed with no better qualification than his natural wit, or any instruments excepting two sticks with the ports marked on them. Notwithstanding all this investigation, any one who undertakes to study the action of a slide valve will nevertheless find it difficult to discover anywhere a full or satisfactory presentation of the whole subject. At the present time there seems to be a renewal of interest in this subject. Valves and the size of ports have lately received more than the ordinary amount of attention, and there is a disposition to reduce the size of steam-ports, so as to make their area smaller than has been employed in the practice of the past ten years. In some cases the effective area of steam ports has been reduced and the reason given for it has been, that with the large ports it is impossible to run a locomotive under ordinary circumstances with the throttle-valve wide open, and therefore it is necessary to wire-draw the steam by partly closing the throttle; where as if the size of the ports was reduced the engine could be run with the throttle-valve entirely open, and full boiler pressure then be admitted into the steam-chest. In reply to this all that seems necessary to say is that it is unimportant whether the steam is wire-drawn by the throttle before it enters, or by the slide valve after it leaves the steam-chest and before it enters the cylinders. The important object to be aimed at is to procure as nearly full boiler pressure as possible in the cylinders during the admission of steam, and then regulate the average pressure by the cut-off. Now if the reduced ports admit steam into the cylinders at considerably less than boiler pressure, then just in proportion as they do this do they lessen the useful effect of the steam; whereas if they admit it into the cylinders at boiler pressure, they are doing exactly what we aim to accomplish with large ports, and therefore it is hard to see how, in this respect, the small ports have an advantage over the larger ones. If for the sake of the argument we admit that a smaller port than that ordinarily used will allow steam to flow into the cylinders so as to fill them with nearly full boiler pressure, it is only saying that our ports are larger than are required, and the only advantage gained by reducing their size is a reduction in the amount of power needed to overcome the friction of the valve. This latter, however, is so small a proportion of the whole power exerted by the

engine that it would not be perceptible in ordinary working.

The truth is, however, that there is reason to believe that the size of the steam ports which are employed with the ordinary link motion is very much too small at high speeds, and that if it were practicable to make them considerably larger, especially for fast-running engines, great advantage would result therefrom. We say we are inclined to believe this, because we have not the proof with which to demonstrate it, but only some data which indicate this very strongly. In considering this subject, persons usually lose sight of two facts: first, the high speed

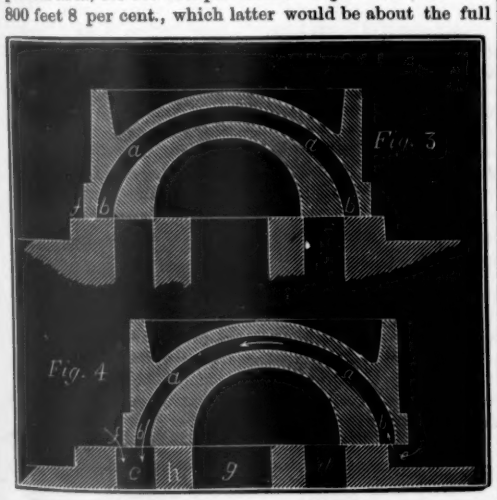


of the piston, and second, the small opening of the ports by the link motion when cutting off short. At twenty miles an hour the speed of the piston of a locomotive with 5-feet wheels and 22 inches stroke is 400 feet per minute; at 30 miles an hour, 600 feet; at 40 miles, 800 feet, and at 50 miles, 1,000 feet. Now it should be remembered that when cutting off at one-quarter or three-eighths of the stroke, the ports are open for the admission of steam only from ¼ to ⅜ inch. Now if the valve is cutting is cutting off at 6 inches of the stroke, and the port is then opened 5-16 inch, at a speed of 50 miles per hour, the steam, in order to follow the piston at boiler pressure, if the cylinder is 16 inches in diameter and the port 14 inches long, must flow through the opening of the port at a speed of over 45,000 feet, or 8½ miles per minute, or more than 500 miles



per hour. The period that the port remains open is only about one thirty-third of a second. It would not be surprising, therefore, if the steam should not flow into the space behind the piston with sufficient rapidity to fill it to nearly full boiler pressure.

Experiments made by Mr. D. K. Clark and recorded in his treatise on Railway Machinery indicate that in order to have a steam pressure in the cylinder which approximates to full boiler pressure, the opening of the port should be about one per cent. of the area of the piston for every hundred feet the latter moves per minute. In other words, the area of this port-opening for a piston speed of 300 feet per minute should be 3 per cent. of the piston area, for 500 feet per minute 5 per cent., and for 800 feet 8 per cent., which latter would be about the full



area of ordinary ports. Bauschinger's indicator experiments also showed that when the piston speed exceeded 500 feet per minute the pressure on the cylinder during admission fell far below the boiler pressure. Indicator diagrams, taken on locomotives at high speeds, nearly always show a rapid fall of the pressure after admission, when steam is cut off short. It is, in fact, a defect of the link motion that at short points of cut-off it opens the port for the admission of steam only a very small proportion of its whole area. The many other good features of the link motion lead us at times to overlook this obvious defect. It is not necessary, nor is there time or room here to restate the arguments in favor of employing steam expansively instead of wire-drawing it. We will assume that the economy of the former method of employing it is proved and admitted. The question then is, how can this be done at high speeds and high degrees of expansion, so as to get the full advantage of it?

The object of this article is chiefly to call attention to several inventions which are not very generally known whose object is to overcome the difficulties referred to above, and which provide a larger opening of steam-port for the admission of steam than can be given by the ordinary valve, when employed to cut off short with the link motion. The first of these, which has already been described in these pages, is the Allen valve, represented by fig. 3, which was patented in this country by Mr. John F. Allen, April 29, 1862. The object which it is intended to accomplish will be understood by reference to fig. 1, which shows an ordinary slide valve in its middle position, and by fig. 2, which shows it with the port open 3-16 inch. If the steam-port was 14 inches long, the total area of the opening would then be 2.6 square inches. In fig. 4, the Allen valve is also represented in the same position as the valve in fig. 2. It will be seen that the outer edge of the port is uncovered the same distance as in fig. 2. But it will also be observed that the edge *e* of the steam-way *a a*, which is cast in the valve, has moved over the edge of the valve-face so that the former is uncovered the same distance as the port *c*, at *f*. When the edge *e* is uncovered, steam can pass through the steam-way *a a*, as indicated by the darts, so that steam is admitted into the port *c* not only through the opening at *f*, but also through that at *e*, which is of the same width as *f*. In other words, this valve gives two openings for the admission of steam with double the area of that in fig. 2. This it does only when it begins to open the ports, as it is obvious that when the whole of the port *c* is uncovered the mouth *b* of the steam-way *a a* will be closed by the bridge *h*. It is, however, only when the port is partly uncovered that the evil of a contracted opening is experienced, and in fact steam ports are made as large as they now are because the link motion does not afford the means of operating them more than a small portion of their width, when cutting off short. This evil the Allen valve, if it does not overcome entirely, at least reduces one-half by giving twice the opening of the ports, when the valve first begins to admit steam.

As we have said heretofore, the value of this valve has, we think, never been properly appreciated in this country. It is now much used in Europe, and is shown in many of the illustrations of locomotives published in foreign technical journals. We recommend its use very strongly to master mechanics in this country.

Next week we will give illustrations of other inventions of valves which we believe to have enough merit to justify a trial by those who are seeking greater efficiency and economy in the performance of locomotives.

The Exhibition of the Franklin Institute.

We continue our description of this exhibition from last week's RAILROAD GAZETTE, and shall follow our notes hereafter without making any attempt at classification. Unless otherwise mentioned, it may be inferred that the exhibitors are from Philadelphia.

Mr. Edward Brown, of No. 311 Walnut street, exhibits several pyrometers for determining high temperatures. These instruments can be used for determining the temperature of the gases in the smoke boxes of locomotives. The same gentle-

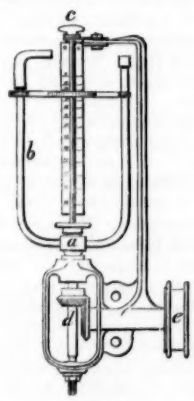


Fig. 1.

man also exhibits an ingenious form of speed indicator, which is represented by fig. 1. It consists of a reservoir, *a*, of mercury, which is made to revolve by a belt over the pulley *e* and a pair of mitre wheels, *d*. To this reservoir a glass tube, *c a*, is attached with a stuffing-box on top of the reservoir, so that the tube stands stationary when the reservoir revolves. A bent metal tube, *b*, is also attached to the reservoir and revolves with it. The glass tube and the reservoir are filled with mercury, so that the bent tube is about half full. When the reservoir *a* and the tube *b* revolve, it is evident that the centrifugal force of the mercury will have a tendency to throw it outward into the bent tube *b*, and thus depress it to a corresponding degree in the glass tube. The amount of depression will be in proportion to the speed with which the instrument is made to revolve. The glass tube is attached to a graduated scale similar to that of an ordinary thermometer. This scale is marked to indicate the number of revolutions per minute, so that at any moment the speed of the instrument and that of the machine to which it is attached can be read off. Whether it would give accurate indications of the speed of a railroad train, if subjected to the jar and unsteadiness of the latter, perhaps nothing but actual experiment will determine. If it could be relied upon under such circumstances it would be very useful in making experiments, such as determining the resistance of trains, the operation of brakes, or in taking indicator diagrams from locomotives.

The Wicaco Screw and Machine Works of No. 505 Cherry street, exhibit specimens of the machine screws, reamers, taps, milling tools etc., which they manufacture.

Mr. G. W. Tulley, No. 136 North Fourth street, exhibits specimens of what he calls his "improved 'paint filling," and also his "improved Belgian varnish filler." It is of course impossible to judge of the qualities of this material from the specimens exhibited, but it is recommended very highly by persons who would hardly attach their names to vouchers of the kind published unless there was some basis of truth for their statements.

The Kensington Bolt & Nut Works of No. 723 Richmond street exhibit a case containing specimens of bolts, nuts, fish-plates, turn-buckles, truck frames, etc., which they manufacture.

Mr. J. Henry Mitchell exhibits specimens of grindstones ranging in size from a small kitchen stone 8 inches in diameter to one weighing three tons marked "for locomotive work." As we are unable to "see through a grindstone" any further than most other people, we cannot speak more definitely of their quality and character than to say that they looked like good stones.

One of the good things at this exhibition is Baker's rotary pressure blower, manufactured by T. Wilbraham & Bros. Its construction is represented by the somewhat imperfect engraving, fig. 2, below. It will be seen that it consists of a re-

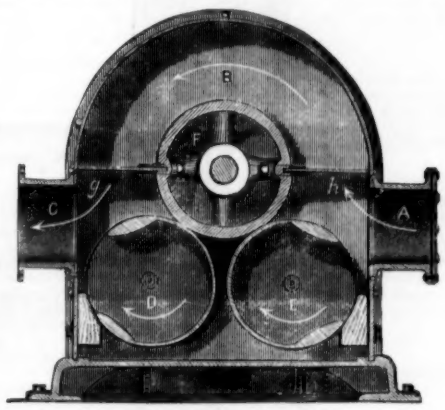


Fig. 2.

volving cylinder, *F*, with two vanes, *g* and *h*, which are fixed to its periphery. Below this cylinder are two other cylinders, *D* and *E*, with openings in their peripheries into which the vanes fall as they revolve. The shaft of the cylinder, *F*, is geared to the shafts of *D* and *E*, so that the latter make two revolutions to one of the former. From this description, and from the darts in the engraving, showing the direction of the currents of air, the operation of this machine will be apparent. We hope at some future time to give a larger and more accurate engraving of it, showing some of the more recent improvements which have been made in it.

Messrs. J. G. Brill &Co., show a one-horse car of beautiful finish with Sherman's patent starter. When it is intended to stop the car, this attachment is thrown into gear by a treadle on the driver's platform. The motion of the car then compresses a spiral spring underneath the car. This spring is compressed in running 10 feet, and will then start a loaded car on a level track. If it will bear the test of practical use, this device will be a very great economizer of horse flesh and doubtless prevent an immense amount of suffering among creatures who utter no complaints.

The same car has a very ingenious, simple and, we should think, effective arrangement for opening and closing the back door. This consists of a shaft running under the floor of the car, with a lever at the front end, which is operated by the driver. At the back end and next the door is a vertical arm, which is connected to the door. The shaft is thus strained with a torsional strain, which moves the vertical arm on the shaft and thus opens and closes the door. The inside of the car is finished very neatly, and has a raised roof, in which is a center lamp. Besides this there are two end lamps with reflectors, so that it can be brilliantly lighted. There are two bell cords, one on each side of the car, so that a passenger can ring the bell without getting up from his seat. The ugliest thing in the car is one of Slawson's boxes for the collection of fares, in which criticism doubtless some drivers will agree with us. The axles of the car run in Higley's patent axle-box, the peculiarity of which, we were told, consists in an arrangement of friction rollers on which the axle turns.

Messrs. Jacob F. Miles & Co., of No. 625 Common street, exhibit specimens of the Keystone injector. They also have several at work on the boilers which are exhibited. We hope, before long, to publish an engraving of this and several other forms of injectors.

The Tanite Company of Stroudsburg, Pa., exhibit one of their new milling machines, of which we will give a large engraving and full description in another number. They also exhibit a number of smaller machines intended for the use of their emery wheels. Of the latter they exhibit a large assort-

ment, of different sizes and qualities. Probably very few mechanics have any adequate idea of the extent to which emery wheels are used and the variety and accuracy of the work which can be done on them. To discuss this properly would require more time and space than we can give to it now, but we hope to take the subject up at an early day.

The Lehigh Valley Emery Wheel Company, of Weissport, Carbon County, Pa., and the Northampton Emery Wheel Company, of Leeds, Mass., both exhibit large assortments of their goods.

Messrs. Cooper, Jones & Cadbury, show a geared Fox lathe with turret attachment, slide-rest, back chasing bar, etc., intended chiefly for brass work. The machine is of good design and well made, and does credit to the manufacturers, of whom we are obliged to confess that we have never heard before.

Messrs. Hoopes & Townsend exhibit a large stand with a great variety of the articles they manufacture, which are very tastefully arranged. These consist of nuts, washers, bolts, screws, rivets, taps, turn-buckles, etc., etc.

Messrs. H. Belfield & Co. have a large exhibit of brass work and steam fittings, such as cocks, globe-valves, safety-valves, whistles, steam-gauges, glass water gauges, etc.

The Midvale Steel Works, of Nicetown, which is a part of Philadelphia, display specimens of their productions, consisting of a steel driving-axle for a locomotive, and steel car and tender axles. Among them is a specimen of an axle of the Pennsylvania Railroad pattern bent nearly to a right angle by three

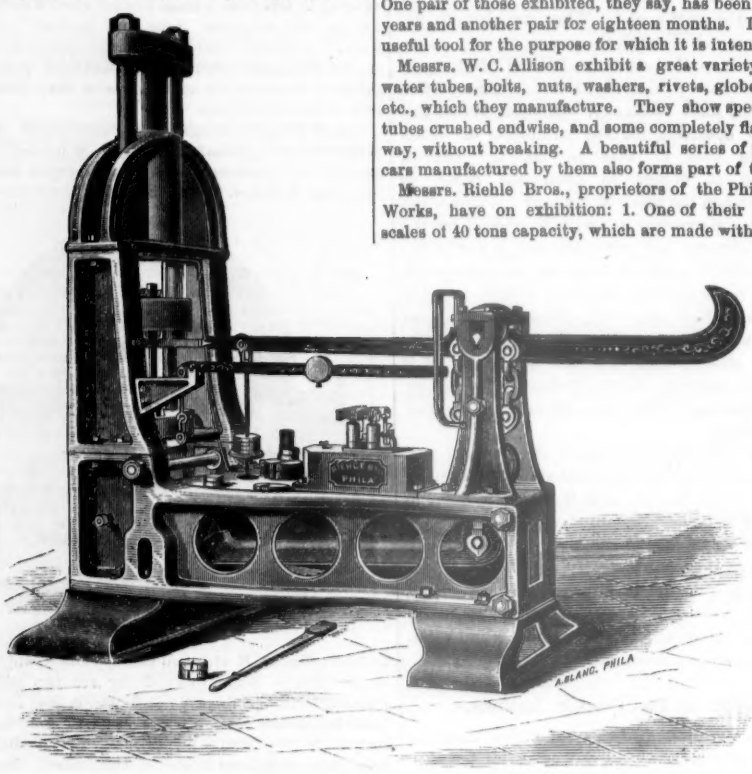


Fig. 4.

blows of a weight of 1,640 pounds falling 20 feet. Another car axle is bent double under a steam hammer, and still another which, it is said, was subjected to the following test: It was placed on bearings three feet apart and exposed to the blows of a weight of 1,640 pounds falling 20 feet, and was reversed after each blow. The deflection after each blow was as follows:

First blow deflected it 7 inches.
Second blow deflected ⅞ inch opposite.
Third blow deflected it 6⅜ inches opposite.
Fourth blow deflected it 1 3-16 inches opposite.
Fifth blow deflected it 5⅛ inches opposite.
Sixth blow deflected it 2¼ inches opposite.

None of these specimens show any signs of fracture. They also show specimens of steel connecting-rods, a pair of locomotive guide-bars, turn-table plates, frog-points and side-bars, blooms for steel rails, and a specimen of a steel rail rolled from their blooms at the Reading Railroad Company's rolling mill, which was twisted into the form of a screw, it is said, and we have no reason to doubt it, while cold. All these specimens are made of Siemens-Martin steel. They also show specimens of spring and bar steel, and of crucible tool steel. Of the latter they exhibit a large assortment of fractured bars in a glass case, and also of the bars themselves. Several locomotive-wheel and car-wheel tires, crank-pins, sledges, boiler-plates with specimens of very difficult flanging, and a chip 196 feet long turned from a steel valve stem for a marine engine completes their exhibit.

Messrs. Nichols, Pickering & Co. show a very good assortment of cast-steel springs. Among these are locomotive, driving-wheel, tender and truck springs, double elliptic, spiral and volute car springs. The neatness of workmanship and gracefulness of form we have never seen excelled.

Mr. Baker exhibits a very ingenious and what we think would prove to be a very efficient sash-holder for car window sashes, which is represented by fig. 3. It consists of a bent steel spring, *D D*, which extends all the way across the sash. This is held by two clamps, screwed fast to the sash. Outside of these clamps and attached to the wire at each end is a bearing piece or shoe, *A* nd *E*. The wire before it put into its position is straight, so that it constantly has a tendency to spring to its original form. Its tension therefore presses the shoes, *A*, *E*, against the window frame, and will thus hold the sash in any position in which it is placed. The wire spring is released by holding on to the piece, *B* and pressing down the latch, *A* with the thumb. This contrivance will hold the sash down as well as up, and locks the windows as effectively as a bolt would. It has the great merit, the want of which we have frequently pointed out, of enabling

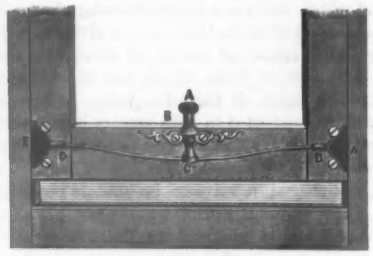


Fig. 3.

a traveler to raise or lower the sash any desired distance, facilities for doing which, for some unccountable reason, are so seldom furnished by car builders.

Messrs. Clark Bros., of No. 106 South Twelfth street, show specimens of what they call their eccentric rivet pipe tongs. One pair of those exhibited, they say, has been in use for four years and another pair for eighteen months. It seems to be a useful tool for the purpose for which it is intended.

Messrs. W. C. Allison exhibit a great variety of boiler and water tubes, bolts, nuts, washers, rivets, globe-valves, cocks, etc., which they manufacture. They show specimens of their tubes crushed endwise, and some completely flattened in that way, without breaking. A beautiful series of photographs of cars manufactured by them also forms part of their display.

Messrs. Riehle Bros., proprietors of the Philadelphia Scale Works, have on exhibition: 1. One of their 4-section track scales of 40 tons capacity, which are made with platforms from 33 to 40 feet long. This scale has their new patent self-adjusting knife-edge bearings, which will adjust themselves in every direction. Another improvement consists in the arrangement of the balance weight, which is moved with an independent screw so that it is not liable to be displaced, as is the case with the ordinary weight. 2. A number of different kinds of scales for weighing hay and cattle, for rolling mills, furnaces, etc., etc. 3. What they call their "parallel crane beam," for weighing objects suspended from it after the manner of the old-fashioned steel-yards. The capacity of the beam exhibited was 15 tons. 4. Two testing machines, each capable of exerting a strain of 20 tons. One of these is built for the Stevens Institute of Technology. 5. A similar machine of a larger size built for Messrs. Anderson & Woods, of Pittsburgh, and capable of exerting a strain of 75 tons. We give an engraving below of this machine. The power which exerts the strain on the specimens to be tested is produced by two hydraulic pumps, one with a large and the other with a small plunger, which are shown in the engraving immediately over the name of the manufacturers. The fluid which is forced by these pumps acts against a plunger, which is represented by the highest portion of the engraving. The force exerted against it is carried downward to a cross-head below the cylinder, to which the test piece is attached. Another similar cross-head below the first one is connected with heavy scale beams, which are in turn connected with the long beam above, which is weighted as shown. The force is thus exerted by the pressure of the fluid acting against the plunger or hydraulic ram, which is resisted by the weights on the scale beam. In this way the power exerted by the hydraulic pressure can be accurately weighed by a system of scale beams acting on steel knife-edges, the same as any ordinary scales. The hydraulic pump and ram are used only to apply the strain, or, as it were, to take up the slack, because the distance through which a compound scale beam can exert its power is so exceedingly small that it would be impossible with it alone to apply any considerable force to a test piece which always stretches more or less before breaking. Probably testing machines will hereafter be employed to a much greater extent than heretofore, and as systems of inspection of all kinds of material for engineering work are more generally and more rigidly applied, the use of some means of determining the quality of material will become absolutely necessary.

The same firm also exhibit one of Professor Thurston's testing machines with automatic register, and we learn they have made arrangements to manufacture this machine.

Messrs. Riehle Brothers announce that they are prepared to make testing machines of all kinds and sizes, and will furnish drawings and specifications for any plan of machine up to five hundred tons capacity.

The Keystone Forge Company exhibit a great variety of their portable forges adapted to almost any use or for any trade. Messrs. S. C. Forsaith & Co. exhibit a Palmer Spring Hammer, an engraving of which will be found in their advertisement on another page.

The McBride Hydraulic Car-Brake Company, of No. 243 South Sixth street, exhibit a full-sized model of a car truck, with their brake attached. It would be impossible to explain the construction of this brake without engravings. The power that is employed is procured from the water in the boiler, which is of course subject to the pressure of the steam above it. This pressure is applied to the brakes by pipes, cylinders and pistons, similar to those used in the Westinghouse air brake, under each car.

The Wharton Railroad Switch Company exhibit one of their patent switches, and also an excellent model by which its operation can be shown better than from the full-sized switch itself. This was illustrated in the RAILROAD GAZETTE of Nov. 11, 1871. They also show specimens of Johnson's frog, in which the parts are secured by wedges which only need to be driven out to remove any part when it requires to be replaced. They also show some beautiful specimens of grooved steel rails bent into curves for horse railroads. The manufacture of these curves they make a specialty. Also they exhibit a portable rail-bending machine, which consists of a heavy cast-iron bed-plate mounted on wheels. This bed-plate has suitable lugs cast on it to receive a heavy screw, and also to hold the rail when pressure is applied to it to bend it.

The Tripler Railroad Cross-Tie Company have specimens of their cross-tie on exhibition. The peculiarities of this will be made clearer by referring to the engraving of it in their advertisement on another page.

The Rue Manufacturing Company exhibit four of Rue's injectors at work feeding boilers. We expect soon to give engravings showing the construction of this instrument.

Mr. James W. Connery exhibits specimens of what he calls his "concave calking" for boiler seams. We will, however, reserve our description of this for the future, when we expect to give engravings of it with a fuller description.

Mr. James Eccles, Engineer, of No. 2,421 Lombard street, exhibits a model of what he calls his "frictionless bearing,' which was used under the central swing span of the South street Bridge, in Philadelphia. This, too, we expect to illustrate soon.

The Philadelphia, the Pennsylvania and the Black Diamond File Works each exhibit a case of their files of beautiful workmanship.

The Philadelphia Smelting Company, of No. 244 South Twenty-first street, have a large assortment of rough brass castings, friction and Babbitt's metal.

Messrs. Fulton, Walker & Co. have among their carriages and other vehicles two express wagons which would excite the envy of any and every driver of such vehicles. One of them was manufactured for the Reading Railroad Company.

Messrs. Wm. J. Young & Co. have on exhibition specimens of their transits, levels and other instruments for engineers.

Among the most beautiful objects exhibited are a number of models of steamships, etc., made of metals which look like silver and gold and which we suppose, from the similar character of the workmanship, are all made by the same maker, Mr. J. Dean Benton, of No. 618 Chestnut street, although his name is only given as the maker of two or three of them. He exhibits a model of a tug boat, of a beam engine, of a Pullman parlor car and of the steamship Pennsylvania, all of the most exquisite workmanship and said to be made accurately to a scale throughout. Messrs. Pusey, Jones & Co., of Wilmington, Del., who were the builders of the steamship Hudson of the Cromwell Line, exhibit a similar model to the above of that boat, and Messrs. Neafie & Levy show a wooden model of a tug-boat of their construction.

We omitted in the proper place to refer to a very neat portable valve-seat facing machine exhibited by Messrs. Kiehner & Odenatt, of No. 1,227 Savery street. In this machine the tool revolves and can be operated either by hand or by a belt driven from a shaft. It is a portable machine and can be attached to any valve face of a locomotive or portable engine. It is beautifully made and looks like a very useful tool.

As we stated when we began this description, the Exhibition of the Franklin Institute is one of the best of the kind we have ever seen, and obviously the people of Philadelphia are getting into good condition for the coming Centennial, which, it is to be hoped, will be a brilliant success.

Record of New Railroad Construction.

This number of the RAILROAD GAZETTE has information of the laying of track on new roads as follows:

Bucksport & Bangor.—The track is laid from Bucksport, Me., northward 15 miles. *Peachbottom.*—The *Western Division* is extended southeastward 9¼ miles to a point 16½ miles from York, Pa. It is of 3-feet gauge. *Jamesville & Washington.*—Completed from Jamesville, N. C., south 10 miles. *Carolina Central.*—Extended from Beaver Dam westward 11 miles to Monroe, N. C., 164 miles from Wilmington. *Savannah & Memphis.*—Extended from Kellyton northwest 6 miles to Atkin's Gap, Ala. *Marietta & Cincinnati.*—The *Baltimore Short Line*, forming a loop at the eastern end of this road, is completed from Belpre westward 30 miles to Warren's, Ohio. *Peoria, Atlanta & Decatur.*—The track is laid from Maroa, Ill., northwestward 10 miles. *Galena & Southern Wis-*

consin.—Extended northward 4 miles (probably just north of the Illinois line) to a point 13 miles from Galena, Ill. *Central of Minnesota.*—This road (late *Minnesota & Northwestern*) extended from Good Thunder's Ford, Minn., southeast 10 miles. *North Pacific Coast.*—Extended from San Rafael, Cal., north 16 miles. It is of 3-feet gauge.

This is a total of 121⅞ miles of new railroad, making 1,363 miles completed in the United States in 1874, against 3,075 miles reported for the same period in 1873, and 5,709 in 1872.

Annual Meeting of the American Society of Civil Engineers.

This Society held its annual meeting on Wednesday, Nov. 4, in the rooms, No. 63 William street, New York. The reports of the Board of Directors of the proceedings of the past year, and of the Treasurer, were read and accepted, and all the old officers were re-elected excepting the directors. Gen. G. S. Greene was added to this board in place of Professor De Volson Wood.

DAMAGES TO A DEAD-HEAD were recently awarded by a jury at Portland, Me., in the case of Ansel Stevens against the Grand Trunk Company. The pass bore the usual contract relieving the company from any claims for injury to the holder, but the court held, as courts have generally held, we believe, that it is not in the power of the company to contract for relief from such responsibility. It seems pretty hard that the company should have to pay $12,800 for injury to a passenger whom it was carrying for nothing, and who had contracted not to hold it liable for personal injury; but the other side of the question is yet the strongest, we believe. If we had only to consider the interests of the dead-heads, we might easily decide in favor of the carrier, but the theory on which the courts hold the companies so strictly responsible is not one of the rights of the injured person simply, but of the public welfare. It is held that to permit the carrier to contract against responsibility would lessen its interest in making transportation as safe as possible, and is likely to result in an increase of accidents. Indeed, the whole theory of holding an employer responsible for the acts of his servants is largely based on this theory of public policy.

Probably not many railroad companies which place this contract on their passes expect to be able to enforce it, but continue to use it, because most honorable men who have made such a contract will not take advantage of the law to break it. In this case, if the jury's verdict is confirmed, the plaintiff will have received a handsome yearly income with his free pass from the railroad company, which, we may hope, will now look with greater favor on the movement for abolishing the practice of issuing free passes.

FAST TIME has been the subject of many newspapers lately. The Chicago & Northwestern, the Chicago, Burlington & Quincy, the New York Division of the Pennsylvania have each produced a specimen of something like a mile-a-minute time, which in each case, we are told, would certainly have been as much as a mile a minute, or probably a little more, but for some impertinent delay or hindrance. But a correspondent on another page gives an example of what may probably remain uncontested as the slowest time on record. The train made a distance of 3¼ miles in two weeks, which we suppose we may call twelve days of ten hours each, which is at the rate of 9¼ rods per hour.

NEW PUBLICATIONS.

Journal of the Railway Association of America.—The first number of this periodical, which we have referred to heretofore as the *Railroad Quarterly*, has at last made its appearance as a very neat octavo magazine of 128 pages, just the size of the *Atlantic Monthly*. The table of contents is the same that we published last July, with the announcement of the intended publication, we believe, with the exception that the additional chapter on the cost of through and local traffic from Mr. Albert Fink's forthcoming work on the Cost of Railroad Transportation does not appear, Mr. Fink having been unable to complete it as yet. The papers in the *Journal* are chiefly papers and selections from reports concerning the cost of carriage by railroad and the economics of transportation which have been published heretofore; so the work is by no means chiefly a contribution to the literature of transportation, but a collection of former contributions. The only exception, we believe, is a paper on the "Proper Rate of Car Hire," by Mr. H. S. Haines, Superintendent of the Atlantic & Gulf Railroad, which occupies four pages. But the selection is well made, for the papers are among the most important published, and are not all easy to obtain now.

As to the sources of the materials contained in this number of the *Journal*, the Massachusetts Commissioners' reports easily lead. Four different papers are taken from these reports, covering fifty of the 128 pages of the *Journal*. These are: "The Carriage of Food, Coal and Raw Materials," from the first report (1870); "Regulation of Tariffs," from the second report; "Legislative Reduction of Tariffs," from the third report; and "The General Railroad Discussion," from the fifth report. From the Transactions of the American Society of Civil Engineers are taken Mr. Martin Coryell's paper, "The Production of Traffic and the Transportation of Freight and Passengers," with the suggestive remarks made during the discussion by Messrs. W. J. McAlpine and Wm. P. Shinn, and Mr. Octave Chanute's valuable paper "The Elements of Cost of Railroad Freight Traffic." Most of the rest of the space is occupied by the heretofore published part of Mr. Fink's most valuable work.

We hardly need express our sense of the value of these papers; we have done it heretofore most emphatically by publishing nearly all of them in these columns as they appeared. Every man interested in these questions should be glad to have them collected and made accessible. We do not know, however, that they can be said to be made "accessible" by this publication; for we believe that few copies are published besides those subscribed for by the railroad companies in advance of publication. There ought to be considerable demand for it.

The preface of the *Journal* makes the following announcement of purposes:

"The object of *The Journal* is threefold: First, to gather in a form handy for reference all papers, essays, etc., on matters relating to railroad economy that may have appeared in other publications; secondly, to provide a medium of communication between those persons who desire to ask for or to communicate information of general value to railroad officers and others interested in the management of railroads; thirdly, to encourage the study of railroad economy in all its details, by supplying to those desiring it all available information, and by inviting those who are making investigations to publish the results of their labors."

It is also announced that it is not intended to issue *The Journal* at regular intervals, but that there will probably be a number once in three months.

General Railroad News.

OLD AND NEW ROADS.

St. Louis, Iron Mountain & Southern.

The Attorney General has given his opinion in favor of allowing a claim made by this company for the value of certain iron and rolling stock belonging to the old Cairo & Fulton Company and taken by the United States for military purposes in 1863. The claim amounts to about $120,000.

Portland & Ogdensburg—Vermont Division.

A bill has been introduced in the Vermont Legislature to authorize the companies composing this line (Lamoille Valley, Essex County, St. Johnsbury and Burlington & Lamoille) to consolidate with each other and with the Portland & Ogdensburg Company of Maine.

The town of Johnson, Vt., has voted to issue its bonds in aid of this line on condition that the road is completed to Johnson depot by December 15.

Burlington & Southwestern.

Mr. E. McKitterick, Receiver appointed by the Iowa Circuit Court, advertises that he is prepared to receive subscriptions for $1,000,000 trustees' certificates, the proceeds of which are to be used to finish the road and pay off the floating debt. Until November 17 holders of bonds will have the first option of subscribing for these certificates. It does not seem likely that they will be taken unless the conflict of jurisdiction between the Iowa & United States Courts is decided.

Somerset.

Work is in progress on an extension of eight miles from Norridgewock, Me., northward to Madison.

The Connecticut Railroad Commission.

The Connecticut Railroad Commissioners are now busily engaged in the regular annual inspection of the condition of the railroads of the State.

Southern Minnesota.

A number of changes are being made by the bondholders, who are now in possession of the road. Wages and all expenses are being cut down to as low a point as possible, and the road is to be worked very cheaply. The main repair shops are to be moved from Wells back to the original location at Hokah.

Portland & Rochester.

This company has completed arrangements for a direct connection with the Grand Trunk over the Marginal Way at Portland. A transfer depot will be put up at once. Besides the Grand Trunk connection this secures to the Portland & Rochester abundant water front and wharf privileges.

Dividends.

Dividends have been declared by the following companies:

Concord Railroad, 5 per cent., semi-annual, payable November 2.

New Bedford Railroad, 4 per cent., semi-annual, payable November 2.

Nashua & Lowell, 4 per cent., semi-annual, payable November 2.

Boston & Providence, 5 per cent., semi-annual, payable November 16.

Boston, Concord & Montreal, 3 per cent., semi annual on the preferred stock, payable November 9.

Cedar Rapids and Missouri River (leased to Chicago & Northwestern), 1 per cent., quarterly, payable November 2.

Cincinnati, Sandusky & Cleveland, 3 per cent., semi-annual on the preferred stock, payable November 2.

Meetings.

The following companies will hold their annual meetings at the times and places given:

Baltimore & Ohio, at the office, Camden Station, Baltimore, November 16, at 10 a. m.

South & North Alabama, in Montgomery, Ala., November 7.

Mississippi & Tennessee, in Grenada, Miss., November 18.

The Hoosac Tunnel Line.

It is now said to be probable that trains will not begin to run through the tunnel before January 1, 1875.

Peachbottom.

On the western or York end of the line track is now laid to a point 16½ miles southeast from York, Pa., and 9¼ miles beyond the late terminus at Dallastown. The grading of the line from York to the Susquehanna, 40 miles, is completed, and tracklaying is in progress. It is intended to reach the forks of Big Muddy Creek, 10 miles beyond the present terminus, and then stop work for the winter. The builders claim that the road thus far has cost only $10,000 per mile, or $12,500 including equipment. October 28 the officers of the company, with a number of invited guests, passed over the line on an excursion, and regular trains now run to the end of the track. The road is 3 feet gauge.

Galena & Southern Wisconsin.

Under date of October 26 the Chief Engineer, Mr. Edward Harding, writes: "We have now 13 miles of iron laid and enough on hand for even more, which I expect to get down and open the 20 miles for business by November 5. We have two locomotives here and 20 cars (14 flats and six box), four more of each to come."

Pennsylvania—New York Division.

A fast train having a number of railroad officers on board returning from a meeting in Philadelphia, was run through from West Philadelphia to Jersey City, October 29. The track was kept clear for it and it was run as fast as possible. It was obliged to run slowly over Trenton Bridge, through Trenton and New Brunswick, to come to a halt at the Central Railroad crossing at Elizabeth, and to slacken speed for the Passaic and Hackensack drawbridges. The time made was as follows, the figures being taken from the train dispatcher's sheet:

	Distance.	Time.
Left West Philadelphia	0.	8.34 a. m.
Passed Trenton	32.72	9.13 "
" New Brunswick	58.25	9.44 "
" Rahway	70.10	9.58 "
" Elizabeth	75.37	10.05 "
" Newark	80.70	10.11 "
Arrived at Jersey City	88.63	10.23 "

The run was thus made in one hour and 49 minutes, the average speed being 48¾ miles per hour. The fastest time was made between Elizabeth and Newark, 5.33 miles in six minutes, or at the rate of 53.3 miles an hour.

The train consisted of three Pullman cars and was drawn by engine 922, which is an anthracite coal burner, cylinders 17 by 24 inches and driving-wheels 5 feet in diameter. Mr. David Reynolds was engineer and T. W. Morris conductor. This fast time is perfectly well authenticated, and though faster long runs have been reported, most of them rest on report only and not on official figures.

Baltimore & Ohio.

The case of the State of Maryland against this company came up in the Supreme Court of the United States, November 2, on appeal from the Maryland courts. It involves the question whether the contract of a loan made by the State by the act of 1835, and accepted by the company, was such a contract as made the company liable to pay the interest provided for in the form of a dividend in gold, notwithstanding the provisions of the legal tender act, or whether it was an ordinary contract which could be discharged in currency. The lower Court decided in favor of the State, but the Court of Appeals reversed that judgment, holding that the interest or dividend was payable in currency generally and not specifically in gold. The question is now argued before the Supreme Court by eminent counsel on both sides.

Georgia Railroad Taxation.

The Comptroller General of Georgia has begun proceedings against nearly all the railroads of the State to collect the taxes assessed upon them under the law of 1874. This law required the companies to make sworn returns the same as are made on other property. Any company desiring to contest the validity of the act could do so, provided it should make the sworn return and continue to pay the tax on net income required by the law of 1873, pending the decision of the suit. The Comptroller General was directed to assess and collect taxes from all companies failing to comply with the law. The Central, Southwestern and Atlanta & West Point have taken steps to contest the law. The companies have heretofore been exempt from local taxation.

Cairo & Vincennes.

Arrangements have been made to put in an incline at Cairo, and to build a transfer boat to run across the Mississippi to the terminus of the Cairo Division of the St. Louis, Iron Mountain & Southern. The latter company will be joint owner of the transfer. Arrangements have been made for the use of the Cairo & St. Louis property at Cairo.

Peoria, Atlanta & Decatur.

Track is laid from Maroa, Ill., on the southern part of the road, northwest 10 miles. Work is also progressing between Peoria and Atlanta.

Galveston, Houston & Henderson.

A branch or extension is being built from the terminus of this road in Galveston, Tex., along the water front, with sidings leading to the end of every wharf. Transfers between ship and rail can thus be made at any point.

Newcastle & Franklin.

Tracklaying is progressing from Mercer, Pa., northward towards Stoneboro.

Western Maryland.

Suit has been brought by Dougherty & Co., bankers of Harrisburg, Pa., to foreclose the second preferred mortgage of 1868, the bonds issued under which amount to $600,000. Interest on these bonds has been unpaid for two and a half years, and the trustees, though requested to do so, have failed to take any action. The plaintiffs have therefore brought suit as holders of the bonds and ask for an injunction and the appointment of a receiver. The suit was to come up in the Baltimore Circuit Court November 7.

Columbus, Chicago & Indiana Central.

At the meeting of stockholders in Columbus, O., October 29, a notice was received from the Pittsburgh, Cincinnati & St. Louis Railway Company that unless the agreement and lease existing between the two companies was properly carried out legal proceedings would be instituted. The matter was referred to the board of Directors, with instructions to take such action as might be necessary to protect the interest of the stockholders. They were also instructed to prepare a full statement of all the obligations of the company and to present the same to an adjourned meeting to be held in New York, December 16.

Houston & Texas Central.

The necessary arrangement having been made for the change of gauge on the 127 miles of road from Corsicana, Tex., to Hearne, the work was begun October 25. The line was divided into sections of four miles, a road-master and 13 men being assigned to each section. Work was begun at daylight and at 1 p. m. a standard gauge-train started from Corsicana and passed over the line with only one mishap. This was at Bremond, where a road-master was found whose gang had stolen a jug of whiskey and got drunk. The Chief Engineer and his assistants who were on the train had to turn out and put in some practical work as track-hands before they could proceed. The transfer machinery for changing cars to trucks of different gauges has been removed from Corsicana to Hearne, where the change will be made hereafter.

The Litchfield Car Company.

A number of railroad men and other invited guests paid a visit to the shops of this company in Litchfield, Ill., Oct. 24. A careful inspection was made of the works, where 160 men are now employed, and the visitors were afterwards entertained by the company. The shops are now running on orders for the Galena & Southern Wisconsin and some Utah and other roads

Railroad Conductors' Life Insurance Association.

The annual meeting commenced in St. Louis, October 28, and continued through the two following days, a large number of delegates being present. The President, Mr. Seymour, made a long address defending the principles on which the Society is founded. The report of the Executive Committee stated that the total claims for death were 44, for disabilities 13. The total amount paid on these accounts was $118,200. The amounts collected on two assessments were still held by the Committee in reserve for further proof. Assessments to the amount of $2,888 were paid from the expense fund. The largest premium paid during the year was $3,000, and the smallest $578. The losses on membership during the year were very large, 636 having withdrawn, and 945 having been dropped from the rolls on account of delinquency. A great many of these losses were caused by the complaints of the management of the Association, and by the hard times which had made no exception in the case of the

Railroad Conductors' Association. But the Executive Committee were blamed in too many instances for simply doing their duty by carrying out the constitution and by-laws. The Committee had urged amendment to the laws again and again, but in each instance their recommendations had been ignored by the Association. A new form of constitution and by-laws had been drawn up by Messrs. Jay and West, which in due time would be submitted to the convention.

The Committee again called attention to the importance of so amending the constitution as to more definitely settle the question of representation. The report concluded with a reference to the difficulties they had been compelled to face in settling losses where there were two or more claimants for the premiums.

Several important amendments to the constitution were submitted and debated, and New York was fixed on as the place for holding the next annual meeting. The Association received invitations to excursions over all the leading out of St. Louis, including one to Denver, which a number of the members accepted.

The General Freight Agents' Association.

The regular semi-annual meeting was held in St. Louis, October 28, all the principal roads and fast freight lines being represented. The business was mainly private and related to the adjustment of rates and other routine business. Before adjournment it was resolved to hold the next meeting in Cincinnati, in May, 1875.

Cincinnati, Hamilton & Dayton.

Work is progressing steadily on the Bowling Green Branch, and it is expected that it will be opened about December 1. It extends from the Dayton & Michigan near Tontogany (20 miles southwest of Toledo) east by south to Bowling Green, O., and is about 10 miles long.

Pittsburgh, Wheeling & Kentucky.

The preliminary injunction against the sale of this road by the trustees still continues in force, and the sale, which was to have taken place October 19, has been postponed.

Sherbrooke, Eastern Townships & Kennebec.

The whole line of this road is now located, and work is progressing rapidly. Track has been laid from Sherbrooke, P. Q., northeast 26 miles, and trains have begun to run over a section of 18 miles from Sherbrook to Lorthrop, which was formally opened by an excur ion Oct 22. A further section of 19 miles is graded and the track is now going down, and the company expects to have this whole 45 miles from Sherbrooke to Weedon in operation by the close of the year.

The line is from Sherbrooke, which is on the Grand Trunk and is the northern terminus of the Connecticut & Passumpsic Rivers road, northeast, following the St. Francis River to Lake Aylmer, thence up Black Creek to Black Lake and across country to a branch of the Palmer River. The road then follows this branch and the Palmer River to the Chaudiere at Morin's, where it connects with the Levis & Kennebec, the track of which road it will use for 27 miles to Point Levis, opposite Quebec. The road from Sherbrooke to Morin's is 93 miles long, making the distance from Sherbrooke to Quebec 120 miles, or five miles less than the Grand Trunk line between the two places. The road was begun in 1860 and was originally intended to be a wooden road for local business.

Binghamton & Montrose.

Surveys are being made for a narrow-gauge road from Binghamton, N. Y., south to Montrose, Pa., where it will connect with the Montrose road to Tunkhannock.

Lehigh & Eastern.

Agents of this company are now trying to secure the right of way along the Delaware Valley from the Water Gap up to Port Jervis.

Hamilton & Lake Erie.

Notice has been given that an application will be made to the Ontario Legislature for power to consolidate the Hamilton & Northwestern Railway Company with the Hamilton & Lake Erie, and to make some amendments to the charter.

Pennsylvania.

To prevent any more frauds like those recently discovered in the alteration of stock certificates this company has adopted a new system, to take effect on and after November 16, 1874. The main features are:

1. All certificates shall have the number of shares thereby represented engraved in letter form in the body of the certificate and the corresponding numeral in figures engraved in the upper right-hand corner.

2. That a separate certificate shall be issued for each amount of shares from one to ten shares inclusive, and for each multiple of ten shares up to and including 100 shares.

3. That no single certificate shall be issued for an amount exceeding 100 shares.

4. That the said certificates to be issued shall be numbered commencing with number one and then be numbered consecutively.

Thus, for instance, a purchaser of 7 shares would receive one certificate; for 77 shares he would receive one certificate for 70 shares and one certificate for 7 shares; for 177 shares he would receive three certificates, one for 100, one for 70 and one for 7 shares. The officers of the company think this plan, if carefully observed, will effectually stop the raising of certificates of stock hereafter.

An order has been issued to the effect that after January 1, 1875, the company will not allow any of its officers or employes to be connected with any other corporation. The company demands that all employes shall devote their entire attention to the duties of their respective positions; that they are not to be interested, directly or indirectly, in the supplies or business of the road, and that all emoluments and profits accruing from any such employment or interest, belonging naturally to the company, are to be turned into the treasury of the road.

North Pacific Coast.

Track is laid to a point 26 miles north from Saucelito, Cal., and 16 miles beyond San Rafael, the late terminus. Work is progressing steadily, and it is expected that the track will reach Russian River this year.

Southern Maryland.

It is stated that the misunderstandings between the company and its creditors have all been adjusted, the President of the road agreeing to deposit bonds of the company to secure all claims upon it until such time as negotiations for the completion of the road are completed. This road is designed to run from Washington down the peninsula between the Potomac and Patuxent rivers.

Savannah & Memphis.

The road is completed and trains are running to Atkins' Gap, Ala., six miles beyond the late terminus at Kellyton and 60 miles northwest from Opelika. Work is progressing steadily on the grading beyond the new terminus.

Central, of Minnesota.

This is the present name of the road, formerly known as the Minnesota & Northwestern, a section of which, from Mankato, Minn., to Wells, is now under construction. The track has been laid to a point six miles northwest from Wells and 10 miles beyond the late terminus at Good Thunder's Ford, making 30 miles of the road completed. It was expected that trains would run to Wells early in November. The company has bought four engines and a number of cars.

Marietta & Cincinnati.

The Baltimore Short Line, which is intended to substitute a shorter and better line for the present eastern end of the road, is completed, the last rail having been laid October 24. It leaves the old line at Warren's, O., 39 miles from the river terminus at Belpre, and runs east by south down the Hocking River about 18 miles, then turns more towards the northeast and follows the general course of the Ohio to Belpre, opposite Parkersburg. It is 30 miles long, and besides the saving of nine miles in distance it avoids a difficult piece of road with heavy grades. Through trains will begin to run over this line early in November, and the old road from Warren's to Marietta and Belpre will be worked as a branch. The new road has been built by a separate corporation, all the stock of which is, however, owned by the Marietta & Cincinnati.

Berks County.

The bankruptcy case against this company was adjourned to November 4, when a decision was to be given on the company's application for a jury trial in the United States District Court. The sheriff's sale has been indefinitely postponed.

Winchester & Alabama.

The Memphis and Charleston Company has leased this road for six years at a rental of $8,000 per annum, to Hickerson & Co., of Coffee County, Tenn. The lessees took possession November 1. The road extends from Decherd, Tenn., on the Nashville, Chattanooga & St. Louis, by a rather circuitous route to Fayetteville, 39 miles. It was originally intended to run southward to the Memphis & Charleston at Huntsville, Ala., but that part of the road was never built. The Memphis & Charleston bought it some years since, when it was sold out to satisfy the State lien.

Paducah & Memphis.

Work has been resumed on this road in Lauderdale County, Tenn.

Chicago & Southern.

This company was organized some months since to build a line for the Chicago, Danville & Vincennes from Dolton to Chicago, the company now using 20 miles of the Columbus, Chicago & Indiana Central between those points. Last June the contract was let to John B. Brown for $175,000, of which $90,000 was to be paid in obligations of H. F. Eames, B. V. Page and R. E. Goodell, and the remaining $85,000 in cash, which was to be obtained by subscriptions to the stock. These subscriptions, then amounting to $130,000, were to be held by a trustee subject to Brown's order until he was paid. He was to complete eight miles each month and the whole line in two and one-half months. Mr. Brown alleges that he was delayed by the engineer and also by the failure of the company to secure right of way. Nevertheless he completed 18 miles of grading, which was as far as the right of way extended, but has since been unable to secure his pay therefor. In the meantime a change in officers had been made and a mortgage for $320,000 executed. It is alleged that this mortgage was made without the consent of the stockholders, and that it was intended to put upon the Chicago & Southern certain debts of the Chicago, Danville & Vincennes, which was to lease the road when completed. Mr. Brown now brings suit to recover his claim and asks for an injunction and the appointment of a receiver, and also for an order to compel the production of the books and records of the company. The Court granted a temporary injunction.

Indianapolis, Bloomington & Western.

The second-mortgage bondholders at their meeting October 20 adopted resolutions appointing a committee to make a thorough examination of the property and affairs of the company. The resolutions state that they doubt the wisdom of funding the coupons as a means of freeing the road from its embarrassments, and that sufficient information has not been furnished to justify bondholders in acceding to the company's proposition. Another resolution states that the trustees being largely interested in the general debt of the company, it is just and proper that they should be removed and other and disinterested parties substituted. A memorial to the board requesting the removal of these trustees, and the appointment of Thomas Denny, Jr., and Josiah B. Blossom has been largely signed.

At the meeting of first-mortgage bondholders in New York, October 29, a majority of the bonds were represented and protection committees were appointed, consisting of Austin Corbin, Jacob B. Jewett and John P. Adriance, to act for the bondholders of the Danville, Urbana, Bloomington & Pekin road (now merged in this company), and of Frank Shepard, W. S. Wyckoff, G. A. Robertson, Remington Vernam and C. P. Williams for the Indianapolis, Bloomington & Western bondholders. These committees are to act together, make an investigation of the company's affairs and recommend such action as they believe to be for the best interest of the bondholders.

Delaware Shore.

The line of this road has been finally located, the right of way secured, and it is intended to begin the work of grading and bridging at once. The road will be 20 miles long and will run from the West Jersey at Woodbury, N. J., west to Paulsborough, and thence southwest through Bridgeport and Pedricktown to Penn's Grove on the Delaware opposite Wilmington, Del. It is, for most of its length, parallel to and about two miles from the Delaware, and the northern half of the line is parallel to and about five miles from the Swedesboro Branch of the West Jersey. Mr. J. W. Allen is Chief Engineer.

Delaware & Hudson Canal.

The men in the shops belonging to the railroads operated by this company are now working only eight hours per day with a corresponding reduction of pay.

Cayuga.

The new company organized by the bondholders who bought the Cayuga Lake road is known as the Cayuga Railway Company. Arrangements are now being made to build an extension of 12¼ miles from the present terminus at Cayuga, N. Y., northeast to the main line of the New York Central at Port Byron. The amount needed has been subscribed, and work will begin very soon.

Grand Trunk.

Work has been begun on a second track from Bonaventure depot by way of Tanneries Junction to Point St. Charles.

Carolina Central.

Trains on the Eastern Division are now running to Monroe, N. C., 164 miles west by north from Wilmington and 11 miles west of the late terminus at Beaver Dam. About 25 miles of track, on which work is progressing, will bring the road to Charlotte and close the gap between the Eastern and Western divisions.

The company recently issued a new certificate of stock for $60,000 to the county of Mecklenburg, N. C., in the place of the old stock held by the county in the old Wilmington, Charlotte & Rutherford Company, which was lost by the foreclosure of the mortgage upon the road in 1872.

Hartford, Providence & Fishkill.

A number of parties connected with the New York and New England Company have been passing over the line from Waterbury, Conn., to Fishkill, N. Y. Much of the grading in Connecticut was done six years ago and is still in fair condition.

Buffalo & Jamestown.

The formal opening of the road to Gowanda, N. Y., was celebrated October 24.

Between Gowanda and Dayton the bridge over Thatcher Run is nearly ready and a very long, deep cut is progressing rapidly. Except this bridge and cut and a short trestle the road is ready for the ties. South of Dayton in the Conewango Valley a force of 200 men is at work. The iron is bought, and it is intended to have the track laid to Cherry Creek, 18 miles from Gowanda, by the end of the year.

South Mountain & Boston.

The contract for grading from Walnut Valley to Portland, N. J., has been let to parties from Reading, Pa. The long cutting at Woodpecker Point has been finished.

The Railroad Mail Service.

Postmaster-General Jewell has issued an order, re-organizing the railroad mail service divisions, and creating a new division with headquarters in St. Louis. The new division will be No. 7, and will comprise the States of Missouri, Kansas, Arkansas, Texas and the Territories of Colorado, New Mexico and the Indian Territory. Mr. W. L. Hunt, now assistant of General Superintendent Bangs, from the Washington office, has been appointed Superintendent, and will shortly take charge of his office, quarters for which have been provided in the post-office building.

Michigan Central.

The employes who were concerned in the attempt to prevent the laying of the Baltimore, Pittsburgh & Chicago crossing at Lake Station were brought up for trial last week, but were dismissed, owing to a flaw in the indictment. This probably ends the proceedings against them.

Wheeling & Lake Erie.

The directors met at Alliance, O., October 22, to consider an offer made by Sandusky of a subscription of $60,000 on condition that the Lake Erie terminus is made at that place. The final decision was postponed to November 3, by which time it was expected that a proposition would be received from Toledo.

North Carolina.

There is a rumor that the lease of this road, now held by the Richmond & Danville, is to be transferred to the Seaboard & Roanoke and Raleigh & Gaston companies, the Richmond & Danville to retain the right to run its trains from Greensboro to Charlotte. The report does not appear to be very well authenticated as yet.

The Brotherhood of Locomotive Engineers.

The annual session of the Grand International Division, at Atlanta, Ga., ended October 28, having lasted a week. The proceedings were mainly private. It was resolved to hold the next annual meeting in New York. After the close of the meeting the citizens of Atlanta entertained the delegates at a banquet.

The Western Order Abolishing Ticket Commissions.

The following circular giving the agreement of the Chicago railroads concerning the payment of commissions for selling tickets was adopted in Chicago October 27, and issued the next day:

"The undersigned, in behalf of the several roads they represent, hereby agree to discontinue the payment of commissions on tickets from and after November 1, 1874, and will instruct and require their agents not to pay or receive any commission, drawback, rebate, or other consideration for the sale of tickets, and further agree that all tickets in the hands of 'outside' agents shall be withdrawn from sale on and after Nov. 1, 1874.

Chicago, Burlington & Quincy Railroad,
By ROBERT HARRIS, General Superintendent.
Chicago & Alton Railroad,
By J. C. MCMULLIN, General Superintendent.
Chicago, Rock Island & Pacific Railroad,
By HUGH RIDDLE, General Superintendent.
St. Louis, Kansas City & Northern Railway.
By W. B. ARTHUR, General Superintendent.
Chicago, Milwaukee & St. Paul Railway,
By S. S. MERRILL, General Manager.
Western Union Railroad,
By S. S. MERRILL, Vice-President.
Chicago & Northwestern Railway,
By H. H. PORTER, General Manager.
Kansas City, St. Joseph & Council Bluffs Railroad,
By J. F. BARNARD, General Superintendent.
Atlantic & Pacific and Missouri Pacific Railroads,
By A. A. TALMAGE, General Superintendent.
Hannibal & St. Joseph Railroad,
By L. W. TOWNE, General Superintendent.
Chicago & Pacific Railroad,
By GEO. S. BOWEN, Vice-President.
Illinois Central Railroad,
By J. M. DOUGLAS."

Detroit & Milwaukee.

In his speech at the recent half-yearly meeting of the Great Western of Canada Company, Mr. Childers, the Chairman, described as follows the latter company's relation to and interest in the Detroit & Milwaukee:

"You are aware that many years ago this company lent to the Detroit & Milwaukee Company £250,000, and you know what is the result of that loan. The position in which you stand in relation to the Detroit & Milwaukee line is, as I before said, considered by some as that of a mere creditor, but others, in my humble judgment with greater justice, regard the shareholders of this company as the proprietors of that line. I have mentioned the debt to this company of £43,000, which has been incurred since the loan for interest and other advances. Now the value to us of the traffic from the Detroit & Milwaukee line has been estimated by some at no less than £120,000 a year—I am speaking of pounds sterling—while others have put it down at only £60,000 a year. Whether it is £60,000 or £120,000 a year that that line brings us I do not pretend to say. In order to determine that question we ought to have better information than we possess at this moment. There is no doubt that we have an interest in the traffic of that line, but what that interest is worth is another question. The position of matters in the Detroit & Milwaukee Company for some time past is that it has not been able to pay us what it owes us, or to pay those who hold bonds *pari passu* with ours. It has paid its ordinary shareholders no dividend and latterly, I am sorry to say, it has got into the position of not being able to pay the interest on its mortgage bonds. It has got into the fangs of the law. An application for the appointment of a receiver has been made in the proper court, and it has been allowed to stand over in the hope that some negotiation will take place. Now, gentlemen, let me state with respect to the Detroit & Milwaukee Company, that since you did me the honor of making me your President I have taken considerable pains to understand its position, and to study those matters connected with it which appear to affect your interests. I and my colleagues are absolutely unfettered by any engagement whatever on that subject, and I shall enter into no engagement until I have been enabled on the spot to go deeply into the question. What we ask you to do on this occasion is to give us and give me full powers. If I go there with a balance at the bankers of two or three hundred thousand pounds on the wrong side, and with no powers, it will be

hopeless for me to attempt to deal strongly and promptly with the very large interests at stake on the part of other corporations or persons as well as ourselves; but, on the other hand, if you give t e Board and myself, acting with the Board, full powers to close with some proposal which, in our judgment, looking only to your interest it is desirable to close with—if you place us financially in a position to close with such an offer, then I think there will be some hope of our dealing with the affairs of that important company beneficially for yourselves. Therefore what the Board proposes to-day is that you should give us full powers to go into the affairs of that company, and to consent to such a rearrangement and reconstruction of their stocks and securities, and render them such financial aid as we may deem advisable. I repeat to you distinctly on this occasion that we have no engagement small or great, direct or indirect, and that we shall not do anything until we have been able to make a thorough examination into the whole question."

Great Western of Canada.

At the half-yearly meeting, Oct. 13, the new Chairman, Hon. Hugh C. E. Childers, M. P., (who had been in the board but about a month,) named the matters which required prompt settlement, but concerning which the board, not being familiar with them, could not present definite plans, but would ask for authority to act without submitting their plans to a future meeting, as the Suspension Bridge, the use of the International Bridge, the Wellington, Grey & Bruce bond issue on sidings, the proposed arrangement with the London, Huron & Bruce, the Detroit & Milwaukee question, and, as minor matters, the Loop Line, the London workshops, and the question of crossing the new Welland Canal. The authority asked was granted. The Chairman stated that the company needed about £300,000 of new capital to free it from its difficulties. As the amount standing to the credit of capital on the books consists chiefly of assets which cannot be realized, there are some debts to pay, and some new works much needed. Mr. Childers thinks that no railroad company's bonded debt should be more than half as much as its share capital, while the Great Western's is 47 per cent. of the whole capital. To obtain the new capital the board proposed to issue to the shareholders new £20 10s. shares at the rate of 23 per cent. of the present holdings, and the proposition having been approved, the board announced the price to be £10 per share, payable in four installments, the first on the 21st of October of this year, the others February 1, May 3, and August 3, 1875. Mr. Childers also obtained authority to make such arrangements as might seem to him advantageous concerning the Detroit & Milwaukee Company, now threatened with bankruptcy, to afford that company financial aid, and to contract to lease or work its road, if he shall think best on an examination on the spot; also to authorize the Wellington, Grey & Bruce Company to issue its bonds at the rate of $12,000 per mile or its sidings not exceeding 17 miles, to confirm an amended contract with the London & Port Stanley; and to contract for the construction and lease of the London, Huron & Bruce, including a guarantee of its 6 per cent. bonds to an amount not exceeding £190,000. Mr. Childers had all his requests granted, and comes to America with the authority and the means to make whatever arrangements he may think best for the good of the company. Mr. Childers closed his speech to the shareholders by stating as follows the purposes of the new Board:

"We wish, in the first instance—I think this is the first thing which would occur to any men who had taken in hand the management of a great enterprise like this—we wish, I say, in the first instance, to put the accounts on a proper footing, and to purge the balance-sheets of all those bad or doubtful items which we think ought not to be there, so that you may know for yourselves what are the real earnings in money and at what cost they are obtained. As we have stated in the report, we hope that at the next half-yearly meeting we shall be able to give you accounts which will be as nearly as possible (the deviations will be of a trifling character), similar in form to those furnished by English railways under the Railway Regulations Act, a form which has stood the test of time very successfully, and in which I believe no material change has been proposed. In the next place we propose to discourage to the utmost any fresh capital expenditure, without actually closing the capital account. The closing of the capital account is what every railway reformer tries to do, but the struggle is, as you are aware, a very difficult one, and no company has ever succeeded yet in doing it. We shall aim at getting as near to that as possible. Our object will be to repress all fresh charges on capital account which are not absolutely necessary in the existing position of the company, and you may rely upon it that we shall carry out that object to the best of our ability. Our third great object will be to endeavor to come to some better understanding with our neighbors on the other side of the water. I go out to Canada, gentlemen, essentially as a man of peace; that is to say, anxious to be on good terms with our friends and neighbors in such a way as will tend to prevent our being put to a disadvantage by those who live by the quarrels of railway companies. That is a matter which I shall do my utmost to set right in America. There is a fourth great object which we have in view. We are determined—I am sure that I represent the feelings of the Board in making this declaration—we are determined to do our best to secure judicious economy in the working of the line. I do trust that we shall achieve this object, and that next year we shall not have to tell you that the proportion of the expenses to the earnings is 84 per cent. Well, gentlemen, I have now told you what we propose to do. But, on the other hand, I would remark that we have no idea that the things which we contemplate can be done in a day. We do not believe in heaven-born Directors, who are able to accomplish great reforms by a stroke of the pen, nor do we believe that everything can be set right in a company like this by a *coup-de-main*. We claim to be men of business, who wish deliberately to carry out sound principles in reference to the questions before them, and we ask you for three things. We ask you to give us time; we ask you to give us patience; we ask you to give us confidence. If you trust us, if you do not expect everything to be done in a year, if you give us time to carry out what we have proposed and have explained to you very plainly, if you give us what we think we must have at once in order to be placed in a position to carry out our views, then, gentlemen, I shall hope that some time hence, after the necessary time has elapsed, we shall be able to come before you under an improved state of things, and you will all admit that we have been faithful stewards of your property."

Burlington, Cedar Rapids & Minnesota.

Suit has been brought to recover $10,000 alleged to be due the United States as taxes on certain coupons on bonds issued between 1867 and 1872. The company's defense is that the bonds in question were not issued and sold but pledged as security, and hence the coupons were exempt from tax. There are some nice legal points involved in the case.

Hempstead & New York.

October 26, the Receiver stopped the running of trains over this road between Hempstead, N. Y., and Valley Stream. The court, however, ordered, October 28, that the road should be reopened and operations resumed.

St. Louis & Southeastern.

The United States Circuit Court at Springfield, Ill., has on application of the trustees under the consolidated mortgage appointed J. F. Alexander and St. John Boyle Receivers. They are to operate the road in the interest of the bondholders. Mr. Alexander is a director and Treasurer of the company. Mr. Alexander is Receiver for all the road in Illinois, Indiana and Tennessee, and St. John Boyle is appointed Receiver for so much of the road as is in Kentucky. The two receivers will, however, work together, and the road will continue to be operated as one line.

It is stated that the present officers will be continued in immediate charge of the road. The first effort will be to clear off the floating debt, especially past-due wages of employes. It is the intention of the bondholders to avoid all litigation if possible, and to arrange everything amicably.

Cumberland & Pennsylvania.

The trustees under the second mortgage advertise for proposals for the sale to the sinking fund of $20,000 of the bonds. Proposals will be received until November 10, and must be addressed to the trustees, at the office of the company, No. 71 Broadway, New York.

Joliet & Northwestern.

Parties interested in this road are busy securing the right of way through the town of Aurora, Ill.

Utah Southern.

Arrangements are being made for an extension of this road southward from its present terminus at Provo, U. T.

Union Pacific.

The United States Circuit Court for Iowa has decided that it has jurisdiction in the Council Bluffs suit against this company, and can by *mandamus* compel the company to run its trains across the Missouri River. The demurrer to the complaint is set aside and the case will be tried on its merits.

Chicago & Alton.

One of the results of the new agreement for exchange of business and *pro rata* division of fares and freights between the Union and Kansas Pacific will, it is said, be the putting on of a through train by this company to run from Chicago to Cheyenne by way of Louisiana, Kansas City and Denver. The train will be so run as to make close connections at Cheyenne with the Union Pacific.

Kansas City & Memphis.

The long law suit between this company and Jackson County, Mo., has been ended by the exchange of papers between the county court and the company in which the expenditures made are acknowledged, and the subscription voted by the county paid over. The company is now trying to negotiate its bonds on 107 miles of the projected road.

New York, Housatonic & Northern.

In the suits brought against this company in the New York Supreme Court, Judge Burnett has appointed Philo T. Ruggles Receiver.

Chicago, Saginaw & Canada.

Ground was broken for this road at East Saginaw, Mich., October 27. East Saginaw has agreed to build the bridge over the Saginaw River.

Boston, Hartford & Erie.

In the suit of James M. Barnard and others, assignees in bankruptcy of this company, against A. J. Farwell & Co., the United States Circuit Court in Boston gave its decision October 30. The case presented was that of a transfer or attempted transfer by the directors of an insolvent corporation to one of their own number, as security for a debt due him by the corporation, of all the available assets of the company, more than nine months before the petition in bankruptcy was filed. The Court decides that the transfer in question cannot, under the circumstances, be declared valid; that the Court cannot allow trustees to protect themselves at the expense of those for whom they are acting in a fiduciary capacity.

Toledo, Wabash & Western.

A large number of employes in the shops at Toledo recently left their work and applied to President Cox to ascertain what prospect there was of securing payment of the three months' wages due them. Mr. Cox promised that they should have at least one month's wages very shortly, and more regular payment hereafter. The men then returned to work.

Michigan Central.

Speaking of changes on this road, the Detroit *Tribune* says: "The latest rumors, which are pretty well authenticated, are to the following effect:

"The north end of the Jackson, Lansing & Saginaw is to be detached from its present management north of Wenona, and attached to the Detroit & Bay City, its through trains and business hereafter going direct to Detroit, with Mr. Sargeant as Superintendent, with headquarters at Detroit and Bay City.

"The branches from Grand Rapids to Allegan, Holland and Muskegon go to the care of Mr. Kimball, of the Chicago & Michigan Lake Shore road, connecting with the main line at New Buffalo."

Fort Wayne, Jackson & Saginaw.

Reports are current that this road will soon pass into the hands of the Baltimore & Ohio, and be operated as a branch of its Chicago line. The road is 100 miles long from Fort Wayne, Ind., north by east to Jackson, Mich., and crosses the Baltimore, Pittsburgh & Chicago very nearly at right angles.

Elizabeth City & Norfolk.

The work of locating this road has been completed, the right of way secured and the contract for its construction let to W. H. Adams & Co., of Washington, who will begin work at once. The line of the road is from Norfolk, Va., southward to Elizabeth City, N. C., and thence southwest through Hertford to Edenton, near the head of Albemarle Sound, a distance of about 70 miles. The work on the road will be very light, as it passes over an almost perfectly level country. It will run for over 40 miles through a somewhat secluded but very fertile country, a large part of which, however, is accessible by river and canal navigation. The road is to be of 3-feet gauge, and it is intended hereafter to extend it southward through Washington to Newbern and Wilmington, and eventually to Charleston, S. C.

Jamesville & Washington.

This road has been for some time past completed and in operation from Jamesville, N. C., on the Roanoke River, southward 10 miles into Martin County, and grading is in progress on an extension of 15 miles to Washington. It is built and owned by a company which has large tracts of timber land along the line, and most of its business is in bringing out lumber to the river.

Western Railroad Bureau.

In accordance with the agreement, circulars giving notice of the abolition of all commissions have been issued by the Pennsylvania Company, the Lake Shore & Michigan Southern, Michigan Central and the lines between Chicago and Cincinnati.

The St. Louis *Republican* of October 31 says:

"We understand from Hon. Isaac H. Sturgeon, a member of the Western Railway Bureau, that the railroads of Missouri and the railroads west of Chicago have united in an agreement somewhat similar to that of the trunk lines East, and the railways that were represented at the Saratoga convention for the abolishment of free passes, rebates, drawbacks and other irregularities. We may add, as learned from another source, that A. A. Talmage of the Atlantic & Pacific, Col. W. R. Arthur of the St. Louis, Kansas City & Northern, Col. Thomas McKissock of the St. Louis, Iron Mountain & Southern Railway, Robert Harris, General Superintendent of the Chicago, Burlington & Quincy, and the Superintendents of the Illinois Central, Chicago, Rock Island & Pacific, and also the other roads leading out of Chicago, have signed the agreement."

Chicago & Pacific.

The Chicago & Northwestern Company has applied to the United States Circuit Court for an injunction to prevent the Chicago & Pacific from crossing its tracks at grade near Elgin, Ill. It is alleged that a grade crossing will be a great injury to its business, and that it can be avoided without much difficulty and at a moderate expense, and by a comparatively slight alteration in the location of the road.

Rockford, Rock Island & St. Louis.

The United States Circuit Court has appointed Mr. W. H. Ferry, of Chicago, Receiver of this road in the pending foreclosure suit. It is understood that this appointment is the result of an agreement of all the parties concerned, and the appointment of Messrs. Cable and Lynde as receivers in the Nickerson suit by the State Court will be withdrawn, thus avoiding all conflict of jurisdiction. Mr. Ferry will take possession of the road as soon as he can file the necessary bonds and have them approved by the Court. Mr. Ferry is a wealthy merchant of Chicago, long a director in the Chicago & Northwestern.

Bucksport & Bangor.

We are indebted to Mr. Parker Spofford, the Engineer of this road, for the following information concerning it:

"This road is being constructed from Bucksport to Bangor, a distance of 19 miles. The track is laid for 15 miles and is approaching Bangor at the rate of half a mile per day. A large force is employed in ballasting, 10 miles of the road being now in good running order.

"The bridge over the Penobscot River at Bangor—a Howe truss 810 feet in length, supported by piers and abutments of first-class masonry—is nearly completed. Extensive preparations are being made for a large freighting business in connection with shipping at Bucksport, which will be the terminal station of the Boston and Portland steamers during the winter months.

"The chief object of the road is to give the Penobscot valley a winter port when the river is closed by ice at Bangor.

"The road has been leased to the European & North American Railway for a term of five years, and it is expected to be ready for traffic by December 1.

ANNUAL REPORTS.

Great Western of Canada.

The report for the half-year ending July 31 covers the operations of the main line and branches worked. These are the Main line from Suspension Bridge to Windsor, 229 miles; the Loop Line from Glencoe to Welland Junction, 128¾ miles; the Toronto Branch, 39 miles; Brantford Branch, 8 miles; Galt Branch, 12 miles; Sarnia Branch, 51 miles; Petrolia Branch, 5 miles; Allanburgh Branch, 8¼ miles; being 472 miles in all. It also leases 15 miles of the Welland Railway, which is worked as part of the Loop Line, making 487 miles. The Galt and Guelph road, 15¼ miles; Wellington, Grey & Bruce, 102½ miles; and the London & Port Stanley, 27 miles, are worked under lease, but only the net profit from this 145 miles of road is reported.

The receipts on capital account during the half-year were £309,038. The charges to capital account were £134,715, of which £18,002 was for land and permanent way; £52,962 on double-track account; £12,053 Glencoe Loop Line; £25,152 discount and commission; £20,920 new equipment and shop tools, and the balance on minor accounts. At the close of the half-year the capital account stood as follows:

Receipts on capital account	£8,422,888
Charges " "	8,238,481
Balance to credit	£184,407

The whole being about $95,000 (currency) per mile owned.

The receipts and expenditures for the half-year were as follows:

	1874.	1873.
Gross receipts	£553,257	£619,839
Operating expenses, including taxes, rents, renewals and all charges	425,303	417,099
Net earnings	£127,954	£202,740
Profit on leased lines	1,081	3,770
Totals	£129,035	£206,510

The decrease in earnings was £66,582, or 10.74 per cent.; the increase in expenses, £8,204, or 1.93 per cent.; the decrease in net earnings, £74,786, or 36.89 per cent. The gross earnings in 1874 were £1,136 and the net earnings £263 per mile. The expenses were 76.87 per cent. of earnings. The net revenue from the leased lines was £7 per mile worked.

The income account for the half year is as follows:

Total net profits		£129,035
Balance from preceding half year		4,360
		£133,395
Interest on bonds and debenture stock	£95,715	
Discount on American currency	31,623	
Ferry steamers renewal fund	2,500	
Alteration of gauge account	9,100	
Balance of damage from floods	1,826	
Balance of interest account	9,511	
Expenses of committee of investigation	3,177	
		153,452
Deficit		£20,057

The dividend for the half year on the 5 per cent. preference stock (which cannot be paid now, but being cumulative will be a charge on the net earnings of future half years) amount to £6,270, making a total deficit July 31 of £26,327.

The receipts and ordinary working expenses per train mile for seven corresponding half years compare as follows:

Half year ending	Earning per train mile.	Working exp. per train mile.
31st July, 1868	8s. 5d.	4s. 8¾d.
" 1869	8 0	4 8
" 1870	7 8½	4 7
" 1871	7 9¼	4 5
" 1872	7 9¼	4 6
" 1873	7 6½	4 11½
" 1874	6 8¾	5 0½

The decrease in earnings per mile during the seven years was 20.05 per cent., and the increase in expenses is 6.17 per cent.

The following table exhibits the receipts and expenses for seven corresponding half years:

Half year ending	Receipts.	Expenses.	Per ct.
31st July, 1868	£356 649	£206,461	58.45
" 1869	385,067	232,767	60.45
" 1870	408 899	251 823	61.58
" 1871	458,890	268,275	58.46
" 1872	550,734	329,456	59.82
" 1873	619,839	417,099	67.28
" 1874	553,257	425,302	76.87

The total amount charged to change of gauge at the close of the year was £63,700, leaving £27,284 yet to be charged. The balance of the ferry steamers renewal fund was £13,294. It

is recommended that the semi-annual charge to this fund be £3,000 hereafter. The locomotive renewal fund was credited with £11,258, and the car renewal fund with £539, making the balances of those funds £55,224 and £3,714 respectively.

The usual investment will be made in Wellington, Gray & Bruce bonds to the extent of 20 per cent. of the additional earnings from traffic interchanged with that line. This amounts, for the half-year under notice, to £4,086.

The board have entered into a provisional agreement with the Canada Southern with reference to access by that company to the Niagara Suspension Bridge. This subject will receive the particular attention of the President when in Canada.

Grand Trunk.

The report of this company for the half-year ending June 30 gives the following figures:

	1874.	1873.
Gross earnings, including Buffalo and Champlain lines	£1,008,551	£898,700
Working expenses and renewals	782,002	721,650
Net earnings	£226,559	£177,050
Deduct loss on American currency	9,019	9,903
Balance	£217,540	£167,147

The working expenses were 77.54 per cent. this year and 80.30 per cent. in 1873. The gross earnings in 1874 were $3,899, American currency, per mile, and the net earnings $876 per mile. The increase in gross earnings is £109,861, or 12.22 per cent.; in expenses, £60,352, or 8.36 per cent.; and in net earnings, £49,509, or 27.96 per cent.

To the sum of £217,540, net earnings, must be added the balance from the net revenue account of last half-year of £241, making a total of £217,781; from this, however, has to be deducted the postal and military revenue due for the half-year to the postal bondholders, £16,209, which leaves £201,572 applicable to the following payments:

Interest on hired cars	£10,007
Interest on land mortgages, temporary loans, Bank of Upper Canada, Montreal Seminary and Island Pond debentures, Portland sinking fund, etc.	13,868
Atlantic & St. Lawrence rental	48,621
Detroit line "	11,251
Montreal & Champlain interest	12 081
Buffalo & Lake Huron rental	32,500
Equipment bonds interest	30,000
	£158,328

Leaving a balance available for dividend for the half-year of £43,244 1s. 4d., out of which the directors paid on the 1st of September last a dividend on the first preference stock for the half year ending June 30 at the rate of 2½ per cent. per annum, absorbing £40,226 17s. 6d., and leaving a balance of £3,017 3s. 10d. Comparing this half year with the corresponding period of 1873, the increase in passenger receipts was £19,291, or 6.59 per cent.; and in the freight receipts, £83,703, or 13.86 per cent. The total number of passengers carried was 903,425 against 761,741, and the quantity of freight was 908,750 against 772,572 tons. The average receipt per passenger was 6s. 1d. against 6s. 9d., and per ton of freight 15s. 1¼d. against 15s. 7¼d. Excluding the renewals, the ordinary working expenses were 72 78 per cent. against 73.21 per cent. The principal increase in the expenditure was in the cost of fuel, and this was in consequence partly of the greater quantity used and partly of the higher price of fuel in 1874 than in 1873. The expenses in the traffic department have also been considerably increased, owing to extra labor necessarily required for the increased traffic, and in some degree to the break of gauge (which now no longer exists) at Montreal. There has further been charged for the first time against working expenses the amount (£10,000) payable to the International Bridge Company for the half year. The total train miles ran were 3,759,869, against 3,292,746, showing an increase of 467,123 train miles; but the cost per train mile in the locomotive department was 37.03 cents, against 38.11 cents, showing a decrease of 1.08 cents per train mile. The increase in the item of fuel was £27,964. The car mileage was 56,728,602, against 41,940,654, showing an increase of 14,787,948; but the cost per car mile was 2.45 cents, against 2.99 cents, showing a decrease of 0.54 cent per car mile. The amount charged to capital account for the half-year is £166,990, the details of which are given in the accounts. This amount includes £87,328 charged in respect of steel rails and renewal of bridges for the half-year. The receipts in American currency during the half-year amounted to $3,629,352, against $2,974,856, of which $496,682 was converted into gold, against $551 800; entailing a loss of £9,019, against £9,903 for the corresponding period of 1873.

Reference is made to the change of gauge east of Montreal, which makes the whole line of standard gauge, except the Arthabaska Branch (35 miles), on which is temporarily stored the broad-gauge rolling stock and which will shortly be altered to the standard.

The President is now in Canada, and he was unable to return in time for the half-yearly meeting, October 29. It was therefore proposed, after the transaction of the ordinary business, to adjourn until December 17, when he will communicate to the stockholders the result of his visit and inspection.

Car-Builders' Monthly Meeting.

The regular monthly meeting was held at the rooms of the Association, on Thursday evening, October 22. A large number of gentlemen were present, including car-builders, car-wheel manufacturers, and others.

Dr. W. C. Tilden, of the Erie Railway, being present, and having accepted the invitation extended to him at the last meeting, was introduced by the Chairman, and made an interesting address on the Nature and Preservation of Wood, a report of which we hope to give hereafter.

CAR-WHEELS.

The meeting then took up the subject of Car-Wheels.

Mr. M. N. Forney opened the discussion by asking, "What makes iron chill?"

Mr. W. W. Snow, of the Bamapo Wheel and Foundry Company, being called for, said he could not tell why iron chills. Some anthracite irons would chill, but, as a general thing, charcoal irons chilled better, although some kinds of charcoal iron were very difficult to chill. He thought much depended on the texture of the iron.

Mr. Jonathan Scoville, of J. & N. C. Scoville, of Buffalo, suggested that the presence of carbon in the iron had something to do with the chilling properties. There is more or less carbon in iron, some in mechanical combination and some chemically combined. No. 1 and No. 2 iron will not chill. No. 3 will chill slightly. No. 4 will chill better. If left to itself, the carbon will naturally crystallize out, but chill it instantly and the iron sets so quickly that the carbon is chemically combined. An anthracite iron will chill if it is run what is called sufficiently high, but usually an anthracite iron is made so soft that the carbon is almost entirely mechanically crystallized. The English chilled short is hardly an anthracite iron, but coke iron enters very largely into the composition of that short.

Mr. Swett, of Troy, had often been asked why anthracite iron would not chill, but had never seen any clear explanation. He had assumed that in anthracite coal the carbon is in a condensed condition, and in the melting process it is brought in contact in a greater quantity with the particles of the ore, so that it was impossible to make a good car-wheel from anthracite iron. Though he had seen good fibrous iron, it was almost wholly discarded by car-wheel manufacturers, from the fact that it took up took much carbon. The fibre becomes crystalline, and the free carbon separates the particles of the iron, and it becomes cubical in form. In charcoal, there is of course as much carbon, but the coal occupies a greater space, and the iron comes in contact with less carbon. All charcoal iron for car-wheel purposes is supposed to be made of brown hematite ores. When the ores are put into the furnace, they give off the hydrates and oxygen and take up carbon, and when they come to the bottom of the furnace and get up to the melting point, if the heat is intense enough, the ore will absorb carbon enough to change the condition from No. 1 to No. 6. More depends on the amount of heat than on the amount of coal.

Mr. Forney—Is the chilling property due to the amount of carbon that is in chemical combination with the iron, or is it that the iron and carbon are in mechanical combination?

Mr. Swett—If there is a large amount of carbon present, either mechanically or chemically combined, I think it will never give good chilled iron. If it is not in mechanical combination, it will not chill.

Mr. Scoville—The hematite ore is very porous and absorbs the gases readily, but the magnetic ore is likely to be still cold on the inside when it is well heated on the surface. The Superior and Iron Mountain irons chill comparatively easy. To make a good wheel, you should have a neutral ore, which nearly all of our hematite ores are.

The President now propounded the following question: Why are there blisters, or honeycombs, on the tread of the wheel?

Mr. Swett thought they were defective spots in the tread caused by running the cold iron against the chill and forming a coating or oxidization of the surface, so that it does not adhere or unite again, and forms these chill-spots.

Mr. W. E. Chamberlain asked why the chill was not of a uniform depth all around.

Mr. Snow said much depended on the manner in which the iron was poured into the mould; in some cases, the flow of the iron cut away a part of the chill.

Mr. Chamberlain said he had known honeycombed wheels to start from New York and go safely through New Haven, Hartford and Springfield, and when they arrived in Boston the chill was almost worn through.

Mr. Scoville said the difficulty with the wheels he speaks of is they are lacking in chill. The spots referred to are simply round, isolated spots. They will be highest in the middle, but the edge round like a ring-a-round. You break the iron through the spot and you will find good iron under it, and perhaps a quarter-inch chill. A wheel made of magnetic or specular ore is almost free from these spots.

Mr. Swett remarked that he had found on using wheels for a number of years, they elongated and were not round. He thought perhaps the chill was thinner on one side than the other, and that it expanded more rapidly in that direction, and that when the wheel was cast very hot, we got a uniform smooth face on the wheel without these marks, after the wheel had been running for years. The cooler the iron, the more those marks would appear. He thought the difficulty would be obviated by the use of a single-plate wheel—a corrugated plate, with the hub far enough above it so that you can cast the wheel with much hotter iron and get almost a perfect tread.

Mr. Scoville disagreed about the single-plate wheel. There were a great many more double plates made than single plates, and so there were more of them spotted, but reduce it to a percentage according to the number in use, and he thought the single plates would show as many as the others. The last wheels he put under four engines were single-plated and excellent wheels, but they had spots on them. It was not because they were not chilled, but the spots came. Still, the spots are much more frequent than they were 15 years ago, and there must be some reason for it.

Mr. W. R. Davenport, of Erie, Pa., did not think the use of a single plate would obviate the difficulty with the spots. They had made both kinds of wheels, and the single-plate was of a pattern supposed to be as good as could be gotten up, but it did not obviate the difficulty, and he did not think it was in the shape of the wheel at all. He did not like to express an opinion as to the cause until they were through with some experiments in which they were engaged. Whenever that could be remedied the hematite wheels would "scoop the market," but that is the trouble now. We have the strength and the durability, and if we can keep clear of those spots we can beat any other iron that is made.

There was another matter that he wished to speak of, and that was the flange-wear of wheels. He knew one thing that most car-builders would bear him out in: that a great deal of carelessness had crept into the wheel-fitting, and many and many a time wheels of two different circumferences get on the same axle. You all know when one wheel travels faster than the other on the same axle, and what that can not help resulting in; it has not made its mileage nor broken in a smash-up, and therefore the wheel-maker has to take it. But the poor wheel-maker cannot help himself. The difficulty is that all 33-inch wheels are not of the same size. I suppose that the car-builders have also discovered that the trucks are not always square, or, as a mechanic would say, they don't "tram," and that is bad on the car-wheels and severe on the truck. We don't happen to have the buying of the iron, but I imagine that the pockets of the company suffer even worse than those of the poor wheel-maker if the iron in the wheel is vastly harder than the iron in the track. For every mismated pair of wheels that goes on to a road the company may charge to profit and loss $50 at least. Of a pair of wheels that made great trouble on a Western road about ninety days ago, it was found that one was about three inches greater in circumference than the other on one axle. It is of the utmost importance that the two wheels on the same axle travel the same distance; and in order to do that, I know of no simpler way than to have the wheels carefully paired when put on. When you are putting on your wheel, push off both old wheels, and fit them up right again. We can save the companies a large amount of money by giving this matter some attention.

Mr. C. E. Garey wanted to know why the core could not be in the center of the wheel; but the question failed to elicit any definite answer at the time.

Mr. Snow said Mr. Davenport's remarks about fitting wheels reminded him that some roads in the country have been in the habit of fitting wheels to a certain gauge. Most car-builders tell him they are fitting wheels ⅝ of an inch laterally, but his experience was that they are sometimes as much as 1⅛ inches. He had counted 40 pairs of wheels in one yard that were broken on the flanges. On an accurate measurement, it was found that the gauge was 1⅛ inch lateral motion, and wheels were pressed on to 1⅛. Pretty nearly all the 40 pairs were pressed on to more than 1⅛ inches. The cause of the breakage was, in his opinion, the strain in passing a stiff guard-rail and a solid frog; the motion being sudden, carries the wheels over and strikes the opposite side of the track and takes the flanges off.

Mr. Chamberlain desired to be informed how you were going to put old wheels of the same size on the axles when the wheel manufacturer had no surety that he could make two wheels of the same size from the same chill. For instance, in buying 50 wheels from a manufacturer, you may possibly find two wheels in the whole lot that will caliper exactly by measuring the circumference. Many persons would be surprised to find how little difference in the circumference it took to cut the flange out.

Mr. Scoville said if you take two wheels marked 6, those wheels will be of the same size, but there will be one wheel marked 6 and another marked 4, because the chills are not exactly alike. Every man who has watched a wheel moulder will have seen him grab hold of the chill and give it a whack with the hammer, and this elongates the chill in one direction. The reason the core is not in the middle is because it isn't put in the middle, and the fault is with the makers. They don't like to cast a wheel twice. If in casting the wheel in lowering it into the pit it touches one side, it hurts it.

Mr. Snow said that where a flange wore, he had often found that one wheel was pressed on further than the other.

Mr. Forney thought the shape of the flange was unsettled. The fact that the same makers have different forms indicates that they are not quite sure that they have the correct forms. Where the side of the rail is curved outward, the flange of the wheel cuts it down.

Mr. C. A. Smith called the attention of the master car-builders to the fact that there was trouble with the side-bearings of the trucks. It is the side-bearings that take the load when the car turns a curve. If we have proper side-bearings that allow a free movement, so that when the car strikes a straight line, the truck will take a straight line, and not take the flange of the wheel to bring it into line, it will remedy the difficulty.

Mr. F. D. Adams thought they would be doing the wheel-makers justice if they exonerated them from the wear of the flanges. He did not believe it was attributable to anything pertaining to the manufacture at all, unless in some exceptional cases, but rather to mechanical defects. Mr. Smith had just touched the point when he spoke of the extremely severe strain on the sides of the truck which prevents its curving with the curve of the track. He thought the fact that so many cars are built by contractors who try to build them in the cheapest possible manner had something to do with it.

Mr. W. E. Partridge said he had investigated one point of the wear and found that it arose from bad joints. The wheels struck a bad joint and were thrown over, jumping against the other side.

Mr. Smith called attention to the hardness of the pressure between the flange and rail when rounding a curve.

Mr. Snow said that those who ask why we don't make as good wheels as they formerly did, forget that cars are heavier and trains run faster and further, and the wheels are in more continuous use than they were ten years ago.

The President thought one of the important causes of the wear of the flange was the bearing of the car on the side-bearings. You could hear them scream after passing a curve for half a mile before the truck would get in line with the track.

The Chair then announced that the next subject would be: Why do we have so many broken wheels?

Mr. Davenport said we had gone on increasing the weight put over the wheel, and the speed at which we drive the wheel, and we wonder that it breaks. We know that we have improved materially in the strength of the iron as it comes from the furnace. We think we have improved in the manufacture of iron in the form of a wheel. You have probably noticed a frog worn out, but left in the track still. You will run a train 50 miles an hour, with coaches weighing 40,000 pounds, and engines weighing a good deal more, over that bad frog, and then people ask why you do not make a wheel now that will stand that kind of thing. If the trackmen will be as careful in keeping up their track and keeping out their bad frogs as the wheel-makers are in making their wheels, I think we will discover a great difference in the breakage. Then there is such a thing as sliding a wheel at one point until you heat it up so as to have a fracture at that point. We hear occasionally of wheels that have run 20 years, and they say: "Ah! I wish they made such wheels nowadays." Well, we do make such wheels now, but they haven't had a chance, and if we wait 20 years we will have them that have been running 20 years.

Mr. Snow thought the breakages were partly due to the change made in the truck by the car-builders driving the hub back from the center.

Mr. Adams, however, contended that this was not the case, as the truck had not been so changed as to throw the wheel back on the inside.

Mr. Scoville said, when a wheel broke it was from poor iron or bad handling. Occasionally a wheel will break very mysteriously, but usually it is owing to bad metal. He had noticed a new class of breakage, a crack from the hub toward the circumference of the wheel. In many instances, you break the wheel and find it exceedingly hard for the sake of getting a long mileage. It is cracked, and almost invariably it has come from a heated journal. The wheel has got hot and the iron wont give. But these wheels very seldom go to pieces.

Mr. Adams—Don't it make a difference whether you cast in a cupola 20 wheels a day or 75?

Mr. Scoville—There is one trouble that wheelmakers have got into. They have had cupolas that would make 15 or 20 wheels a day, and they have tried to get 50 out of them. The true way to melt cast-iron is to melt it as long as you would in a furnace.

Mr. Snow—Yes; after a cupola has run two hours and a half, it is time to dump it out, and the longer it runs, the more it is deteriorated. I have got a cupola that runs 100 wheels a day, and it makes better wheels than we get out of any small cupola we have. The iron is two or three hours heated, and becomes a higher quality of iron.

Mr. Scoville—In England they commenced with air furnaces, but now they use cupolas altogether, very large, and with a higher draft.

Mr. Davenport—We have been testing this matter very carefully for six months past; we have one cupola of 6, and one of 7 feet, about 42 feet high. We can run down 100 wheels from one of these cupolas, and bring the iron in as nice shape as you ever saw iron worked. We have made some important changes in our cupolas to do it, and I have no doubt that all that Mr. Scoville has said is true, that if you wire-draw your blast you don't melt your metal as it should be melted. I apprehend there is very little breakage of wheels, in fair service, of any maker that claims to make a first-class wheel nowadays; they are cheap wheels, bought for cheap wheels.

Mr. Swett related an incident which occurred during the war when he and others had a contract for making 15-inch shot for the Government. He bought some charcoal iron, and they commenced making shot, but word was sent to him that the iron was bad; it was dirty, and the slag ran over the top of the cupola. He finally visited the works, and found them running the gauge to a ¾-inch pressure. He told them to turn off the blast to ⅜, which they did, and what slag was made he could have taken in his two hands and carried it out. As to the breakage of wheels, he did not think it depended altogether on the quality of the iron. He had seen good whe ls come into the yard with the plates broken, and he could take the blade of his jack-knife and put it right through the plate of the wheel. On the other hand, he had seen wheels in the yard that had run for years, and when they broke them the iron was gray, and yet the wheel was good and had a good chill on. His idea was that one of the most essential things was that the wheel should be cooled properly. You may put ever so good iron into a wheel, and unless the heat is taken off from the hub and it is cooled properly, there will be a strain between the plate and the hub, and they are likely to pull apart.

Mr. Scoville thought that the master mechanics ought to insist that every broken wheel be returned to the makers to replace. It would give the makers much valuable information.

On motion, it was resolved that this subject be continued at the next meeting, and that the car-wheel manufacturers be invited to attend.

The meeting then adjourned.